Human APS kinase/A Human secreted pro Fragment of human

.rag 38 6.2 624 20 38 6.2 625 20 36 5.9 36 19 22 3.6 460 21 22 3.6 460 21 21 3.4 373 21 21 3.4 375 21 21 3.4 378 21 21 3.4 378 21 21 3.4 378 21 21 3.4 385 21 21 3.4 386 21	21 3.4 425 21 21 3.4 4465 21 21 3.4 465 21 21 3.4 465 21 21 3.4 465 21 21 3.4 476 21 21 2.0 2.0 154 21 12 12 12 12 12 12 12 12 12 12 12 12	39 12 2.0 251 21 AAG38141 40 12 2.0 259 21 AAG38141 41 12 2.0 263 21 AAG14477 44 12 2.0 263 21 AAG14176 45 12 2.0 263 21 AAG14176 46 12 2.0 276 21 AAG11015 47 12 2.0 276 21 AAG38146 47 12 2.0 276 21 AAG3816 47 12 2.0 276 21 AAG3816 47 12 2.0 276 21 AAG3816 48 11 1.8 161 21 AAG5425 50 11 1.8 204 23 ABP3672 51 11 1.8 204 23 ABP3672 52 11 1.8 204 23 AAG44792 53 11 1.8 246 21 AAG44792 54 11 1.8 252 21 AAG4457 55 11 1.8 305 21 AAG4457 56 11 1.8 305 21 AAG4457 57 11 1.8 310 21 AAG4457 58 11 1.8 305 21 AAG4457 59 10 1.6 201 22 AAG8409 60 10 1.6 343 21 AAY44791	RESULT 1 AAU32438 ID AAU32438 XX AC AAU32438; XX AC AAU32438; XX AC ABU52438; AC AC AC ABU52438; AC AC AC ABU52438; AC
Jun 5 08:31:25 2003  GenCore version 5.1.6  Copyright (c) 1993 - 2003 Compugen Ltd.  May 30, 2003, 12:20:35 Search time 73 Seconds (Without alignments) (Without alignments) (Without alignments)	MAPKAWKVLTDYYÄSEMDKN 615 dues meters: 61	2101002:*    101002:*   22/gcdata/geneseq/geneseqp-embl/AA1   22/gcdata/geneseq/geneseqp-embl/AA1   22/gcdata/geneseq/geneseqp-embl/AA1   22/gcdata/geneseq/geneseqp-embl/AA1   22/gcdata/geneseq/geneseqp-embl/AA1   22/gcdata/geneseqfygeneseqp-embl/AA1   22/gcdata/geneseqfygeneseqp-embl/AA1   22/gcdata/geneseqfygeneseqp-embl/AA1   22/gcdata/geneseqfygeneseqp-embl/AA1   22/gcgdata/geneseqfygeneseqp-embl/AA1   22/gcgdata/geneseqfygeneseqfygeneseqp-embl/AA1   22/gcgdata/geneseqfygeneseqfygeneseqp-embl/AA1   22/gcgdata/geneseq	Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.    SUMMARIES   SUMMARIES   SUMMARIES   SUMMARIES   STATISTIC   State   Stat

Human; vaccination; gene therapy; nutritional supplement; stem cell proliferation; haematopoiesis; nerve tissue regeneration; immune suppression; immune stimulation; anti-inflammatory; leukaemia.

Arabidopsis thalia Arabidopsis thalia

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gastrointestinal disorder; developmental disorder; genetic disorder; neurological disorder; reproductive disorder; smooth muscle disorder; immunological disorder; inflammation; diagnosis; therapy; ATP sulfurylase/APS kinase 2.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVRAE 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           identifying agents (agonists and antagonists) that bind to them. Cells expressing the proteins are useful for identifying a therapeutic agent for use in treatment of a pathology related to aberrant expression or physiological interactions of the polypeptide. Vectors comprising the nucleic acids encoding the polypeptides and cells genetically engineered to express them are also useful for producing the proteins. The proteins are useful in genetic vaccination, testing and therapy, and can be used as nutritional supplements. They may be used to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                       polypeptides and antibodies to the polypeptides are useful for determining the presence of or predisposition to a disease associated with altered levels of polypeptide. The polypeptides are also useful for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          98
                                                                                                                                                               Nucleic acids encoding a range of human polypeptides, useful in genetic vaccination, testing and therapy -
                                                                                                                                                                                                                                                                                                                                                                      increase stem cell proliferation, to regulate haematopoiesis; and in bone, cartilage, tendon and/or nerve tissue growth or regeneration; immune suppression and/or stimulation, as anti-inflammatory agents; and in treatment of leukaemias. AAU29510-AAU33304 represent the amino acid sequences of novel human secreted proteins of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               27 MSGIKKQKTENQQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDS
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                                                                                                                                                                                                                             to novel human secreted polypeptides. The
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                   46.8%; Score 288; DB 22; Length 648; 100.0%; Pred. No. 7.8e-282; ive 0; Mismatches 0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 20; Page 613; 765pp; English.
                                                                                                                   Liu C, Drmanac RT;
                                                        18-APR-2000; 2000US-0552929.
26-JAN-2001; 2001US-0770160.
                                 16-APR-2001; 2001WO-US08656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                             invention relates
                                                                                                                                           WPI; 2001-611725/70
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nes 288; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                              648 AA;
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/note= "potential O-phosphorylation" 285

'note- "potential O-phosphorylation" "potential O-phosphorylation" "potential O-phosphorylation" 'note "potential O-phosphorylation" "potential O-phosphorylation" 'note= "potential O-phosphorylation" /note= "potential O-phosphorylation" /note= "potential O-phosphorylation" 'note- "potential N-glycosylation" "potential N-glycosylation"

"potential

/note= 308

'note=

'note=

'note-

'note= "potential O-phosphorylation"

"potential

/note= 198

'note= "potential O-phosphorylation" 'note= "potential O-phosphorylation"

Location/Qualifiers 92

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treating cancers and developmental, gastrointestinal, genetic, immunological, neurological, reproductive and smooth muscle disorders
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The present sequence is that of human transferase TRNSFS-6, 1 of 15 claimed novel human transferase proteins of the invention (see AAY79209-23). The sequence was deduced from a CDNA clone (see AAX94206) isolated from a foetal Kidney library. It shows homology
                                                                                                                                                                                                                                                                                                                                                                                                        Human transferase proteins useful for preventing, diagnosing and
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                                                                                                                                                                                                                                                     Baughn MR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 1; Page 84-85; 113pp; English.
                                                                                                                                                                                                                                                     Guegler KJ,
                                                                                                                      98US-0186779.
                                                                                                                                                                                                   (INCY-) INCYTE PHARM INC.
                                                                                                                                                                                                                                                                               Azimzai
                                                                                                                                                                                                                                                     Corley NC,
                                                                                                                                                                                                                                                                                                                            WPI; 2000-256996/22.
N-PSDB; AAZ94206.
                                               09-SEP-1999;
                                                                                                                      04-NOV-1998;
11-MAY-1999;
                                                                                                                                                                                                                                                  Tang YT, Co
Hillman JL,
16-MAR-2000
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AAY79214 standard; Protein; 619 AA.

Human transferase TRNSFS-6

19-JUN-2000

X Z X Z X B

/note= "ATP/GTP binding site (P-loop)"

/note=

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63 EEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFI 122
                                                                                                                                                                                                                                                                                                                                                                                                                  The invention relates to a single exon nucleic acid probe for measuring human gene expression in a sample derived from human foetal liver. The single exon nucleic acid probes may be used for predicting, measuring and displaying gene expression in samples derived from human fetal liver. The present sequence is a peptide encoded by a single exon nucleic acid probe of the invention.

Note: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from WIPO at ftp.wipo.int/pub/published_pct_sequences.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Protein #6682 encoded by probe for measuring heart cell gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Single exon nucleic acid probes for analyzing gene expression in human
                                                                                                    Human genome-derived single exon nucleic acid probes useful for analyzing gene expression in human fetal liver
                                                                                                                                                Claim 27; SEQ ID NO 32901; 639pp + sequence listing; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Human, gene expression; heart; microarray; vascular system; cardiovascular disease; hypertension; cardiac arrhythmia; congenital heart disease.
                                                                                                                                                                                                                                                                                                                                              10.6%; Score 65; DB 22; Length 65; 100.0%; Pred. No. 2.1e-57; tive 0; Mismatches 0; Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ABB24683 standard; Protein; 65 AA.
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2000US-0207456.
2000US-0608408.
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21-SEP-2000; 2000US-0234687.
27-SEP-2000; 2000US-0236359.
04-OCT-2000; 2000GB-0024263.
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                                                                                                                                                                                                                                                                                                                                                             1 Similarity 100.065; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                              123 SPFAK 127
                                                                                                                                                                                                                                                                                                                     65 AA;
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30-JUN-2000;
03-AUG-2000;
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                                                                                                                                                                                                                                                                                                     289 DGVINMSIPIVLPVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGT 348
                                                                                                                                                                                                                                                                                                                    349 TCTKHPHIKMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAF 408
                                                                                                                                                                                                                                                                                                                                                                         PTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTRMRKLAREG 588
to human ATP sulfurylase/APS kinase 2. TRNSFS-6 is expressed in cardiovascular, gastrointestinal, reproductive and endocrine its sues, especially those associated with cancer, inflammation, and can be used in the diagnosis, prevention and treatment of cancer, developmental disorders, gastrointestinal disorders, genetic disorders, immunological disorders, meurological disorders, reproductive disorders, and smooth muscle disorders. The polypeptides can also be used to raise antibodies, and to screen for agonists and antagonists of transferase activity.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Human; foetal liver; gene expression; single exon nucleic acid probe.
                                                                                                                                                                                                                                                                           0;. Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Peptide #7772 encoded by human foetal liver single exon probe.
                                                                                                                                                                                                                                          35.9%; Score 221; DB 21; Length 619; 99.7%; Pred. No: '3.7e=214; tive 0; Mismatches 1; Indels 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Penn SG, Hanzel DK, Chen W, Rank DR;
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26-MAY-2000; 2000US-0207456.
30-JUN-2000; 2000US-0608408.
03-AUG-2000; 2000US-0632366.
21-SEP-2000; 2000US-0234687.
27-SEP-2000; 2000US-023659.
04-OCT-2000; 2000GB-0024263.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                            Best Local Similarity 99.7
Matches 321; Conservative
                                                                                                                                                                                                                     619 AA;
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of nervous system

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which may enable the diagnosis diseases such as Alzheimer's di
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                           epilepsy
                                                               Sequence
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     The present invention relates to single exon nucleic delight probes for measuring human gene expression in a sample derived fixpun human heart (see ABA1335-ABA4305). The present sequence is a protein encoded, by one such probes may be used for predicting, measuring and displaying gene expression in samples derived from the human heart, via microarrays. By measuring gene expression, the probes are useful for predicting, diagnosing, grading, staging, monitoring and prognosing diseases of the hypertension, cardiac arrhythmias and congenital heart disease. Note: The sequence data for this patent did not form part of the printed specification, but was obtained. In electronic format directly from WIPO at the wipo int/pub/published_pit_sequences.
                                                                                                                                                                                                                                               EEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFI 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The present invention provides a number of single exon nucleic acid probes which are derived from genomic sequences expressed in the human brain. They can be used to measure gene expression in brain cell samples,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Single exon nucleic acid probes for analyzing gene expression in human brains -
                                                                                                                                                                                                                                                             Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein SEQ ID
                                                                                                                                                                               10.6%; Score 65 bb 22; tength 65;
                                                                                                                                                                                                                      0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene expression analysis;
                                                                                                                                                                                                                                                                                                   microarray; Alzheimer's disease; multiple sclerosis;
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                                                                                                                                                                                                                                                                                                                                                                                    AAM61056 standard; Protein;
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tes 65; Conserv
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                                                                                                                                                                                 63 EEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFI 122
present sequence is a protein encoded by one of
                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Example 4; SEQ ID NO: 34066; 658pp + Sequence Listing; English.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Human; bone marrow expressed exon; gene expression analysis;
microarray; cancer; leukaemia; lymphoma; myeloma.
                                                                                                Length 65;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                probe encoded protein SEQ
                                                                                                Score 65; DB 22; I
Pred, No. 2.1e-57;
0; Mismatches 0;
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2.1e-57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       analyzing gene expression in human bone marrow
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 65;
Pred. No.
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                                                                                     10.6%; Scur
100.0%; Pro
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100.0%; Pre
0;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Chen W,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  expressed
                                                                                                                                                                                                                                                                                                                                                                                                        AAM73760 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Human genome-derived single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30-JAN-2001, 2001WO-US00668
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
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Best Local Similarity 100.
Matches 65; Conservative
                                                                                                                                          Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 2001-488900/53
                                                                                                                     Best Local Similarity
Matches 65; Conserv
                                                                                                                                                                                                                                                                SPFAK 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Human bone marrow
                                                           AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   65 AA;
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21-SEP-2000;
27-SEP-2000;
04-OCT-2000;
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30-JUN-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       06-NOV-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Homo sapiens
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 09-AUG-2001
                     the probes
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ABG43644 standard; Peptide; 65 AA
                        ABG43644;
                                                                                                                                                                                                                                                                                                                                                                                                                        Penn SG,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFI 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present invention relates to single exon nucleic acid probes (SENP: see AAI31315-AAI57546). The present sequence is a peptide encoded by one such probe. The probes are useful for producing a microarray for predicting, measuring and displaying gene expression in samples derived from human placenta. The probes are useful for antenatal diagnosis of human genetic disorders.
            Peptide #7984 encoded by probe for measuring placental gene expression.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Human genome-derived single exon nucleic acid probes useful for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 65;
                                                                                                                                                                                                                    Probe; microarray; human; placenta; antenatal diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10.6%; Score 65; DB 22; Length 65
100.0%; Pred. No. 2.1e-57;
ive 0; Mismatches 0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               analyzing gene expression in human placenta -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 27; SEQ ID No 34216; 654pp; English.
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                                                                                                                          AAM33947 standard; Protein; 65 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                              (MOLE-) MOLECULAR DYNAMICS INC.
                                                                                                                                                                                                                                                                                                                                                   2000US-0180312.
2000US-0207456.
2000US-0608408.
2000US-0632366.
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2000US-0236359.
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                                                                                                                                                                           (first entry)
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Best Local Similarity 100.
Matches 65; Conservative
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                                             SPFAK 127
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SPFAK 65
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                                                                                                                                                                                                                                  genetic disorder
                                                                                                                                                                                                                                                                               WO200157272-A2.
                                                                                                                                                                                                                                                         Homo sapiens.
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04-OCT-2000;
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26-MAY-2000;
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21-SEP-2000;
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                       Н
                                             123
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                                                                                                     RESULT 7
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RESULT 8 ABG43644

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The invention relates to a spatially-addressable set of single exon nucleic acid probes for measuring gene expression in a sample derived from human lung comprising single, exon nucleic acid probes having one of 12614 nucleic acid sequences mentioned in the specification, or their complements or the 12387 open reading frames derived from the 12614 probes. Also included are a microarray comprising the novel set of probes which hybridise at high stringency to a nucleic acid expressed in the human lung; measuring gene expression in a sample derived from human lung, comprising of a conlection of detectably labeled nucleic acids derived from human lung, comprising of a collection of detectably labeled nucleic acids derived from human lung a sample derived from human lung, comprising of a collection of detectably labeled nucleic acids derived from human lung array; identifying exons in a eukaryotic genome, comprising of the eukaryote; and (b) detecting specific hybridisation of detectably labeled nucleic acids from enkaryote lung mRRM, to a single exon probe, having a fragment identical to the predicted exon; the probe is included in the above mentioned microarray; assigning exons to a single exon in the above and (b) measuring the expression of each of the exons in several cissues and/or cell types using hybridisation to a single exon microarrays having a probe with the exon, where a common pattern of expression of the exons in the tissues and/or cell types indicates that the exons should be assigned to a single gene; a peptide comprising one of the exons in the tissues and/or cell types indicates that the exons should be assigned to a single gene; a peptide comprising one corpusion microarrays mentioned in the specification, or encoded by the expression analysis, and for identifying exons in a gene, particularly cusing human lung derived mRNA and for the study of lung diseases
                                                                                                                               Human peptide encoded by genome-derived single exon probe SEQ ID 33309
                                                                                                                                                                                                                                                             Hermansky-Pudlak syndrome; sarcoidosis; pulmonary haemosiderosis; pulmonary histlocytosis; lymphangioleleomyomchosis; Karagener syndrome; pulmonary alveolar proteinnosis; fibrocystic pulmonary dysplasia; primary cillary dyskinesis; pulmonary hypertension;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           set of single exon nucleic acid probes, used to
                                                                                                                                                                         Human; single exon probe; asthma; lung cancer; COPD; ILD;
chronic Obstructive pulmonary disease; interstital lung disease;
familial idiopathic pulmonary fibrosis; neurofibromatosis;
tuberous sclerosis; Gaucher's disease; Niemann-Pick disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 measure gene expression in human lung samples
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 27; SEQ ID No 33309; 634pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rank DR;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (MOLE-) MOLECULAR DYNAMICS INC
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2000US-234687P.
2000US-236359P.
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2000US-0608408.
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                                                                                  19-AUG-2002 (first entry)
                                                                                                                                                                                                                                                                                                                                                    hyaline membrane disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Spatially-addressable
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 2002-114183/15.
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                                                                                                                                                                                                                                                                                                                                                                                                                                      WO200186003-A2
                                                                                                                                                                                                                                                                                                                                                                                               Homo sapiens.
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30-JUN-2000;
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27-SEP-2000;
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63 EEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFI 122
                                                                                                                                                                                                              (COPD), interstitial lung disease (ILD). familial idiopathic pulmonary fibrosis, neurofibromatosis, tuberous sclerosis, gaucher's disease, Namenan-Puck disease, Hermansky-Pudlak syndrome, sarroidosis, pulmonary heemosiderosis, lymphangioleiomyomtosis, pulmonary pulmonary histocytosis, lymphangioleiomyomtosis, pulmonary dysplasia, prinary ciliary dyskinesis, pulmonary hypertension and hyaline membrane disease. The present sequence is, a peptide/protein encoded by a single exon probe of the invention. Once: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from WIPO at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Isolated nucleic acid molecules encoding novel ovarian polypeptides, useful in the prevention, treatment and diagnosis of cancer (e.g. ovarian cancer), immune disorders, cardiovascular disorders and
                                                                                                                                                        10.6%; Score 65; DB 23; Length 65; 100.0%; Pred. No. 2.1e-57; Live 0; Mismatches 0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (HUMA-) HUMAN GENOME SCI INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              07-JUN-2000; 2000US-209467P.
                                                                                                                                                                     1 Similarity 100.0
65; Conservative.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        neurological diseases
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N-PSDB; ABQ54857.
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                                                                                                                                        65 AA;
                                                                                                                                        Sequence
                                                                                                                                                                                                                                            123
                                                                                                                                                             Query Match
                                                                                                                                                                      Best Local
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The invention relates to 2175 novel human ovarian antigens (ABP41054-ABP43228) and to cDNAs encoding them (ABQ54131-ABQ56305), and also encompasses polypeptides 90% identical and polynuclectides 95% identical to the sequences of the invention. The invention additionally relates to recombinant vectors and host cells. Comprising human ovarian antigen so polynuclectides, antibodies against human ovarian antigens, and the use of ovarian polynuclectides and polypeptides in diagnosing, treating, prognosing or preventing various ovary and/or breast cancer, and disorders. Such conditions include ovarian cancer and breast cancer, and metastic tunnours of ovarian or breast origin, reproductive system of isorders (e.g., infertility, disorders of pregnancy, anovulation, polycystic ovary syndrome, ovarian cysts, and dysmenorrhoea), endocrine disorders, infertility, disorders of pregnancy, anovulation, cancer syndrome, inflammatcry conditions (e.g., mastitis, cophoritis and vaginitis), immune disorders (e.g., congenital and acquired the conformed, inflammatcry conditions (e.g., mastitis, cophoritis and vaginitis), immune disorders (e.g., anaemia), cardiovascular disorders. blood-related disorders (e.g., anaemia), cardiovascular disorders and urinary system disorders. Ovarian antigen polypeptides and compounds which modulate ovarian antigen expression or activity. The polynucleotides may also be used in screening for compounds which modulate ovarian antigen expression or activity. The polynucleotides may be used as food additives or to prepare antibodies useful in disease diagnosis, drug targeting and phenotyping. The present consequence represents a human ovarian antigen of the invention.

Consequence represents a human ovarian antigen of the invention of the present of the prepare antibodies appeared by the sequence data for this patent did not form part of the printed sequence data for this patent did not form part of the prepare antibodies at the sequence data for this patent did not format directly from WIPO con the prep
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Human disease related nucleotide kinase-2; DRNK-2; deoxyguanosine kinase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Human disease related nucleotide kinase-2 (DRNK-2) protein sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "adenosine 3'-phosphate 5'-phosphosulfate (PAPS)-dependent enzyme motif"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     p21ras; cell proliferation; oncogenesis; cancer; PAPS; immune disorder; neurological dysfunction; gene therapy; adenosine 3'-phosphate 5'-phosphosulfate-dependent enzyme motif; ATP pyrophosphatase PP-motif.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 8.9%; Score 55; DB 23; Length 133; Best Local Similarity 100.0%; Pred. No. 5.1e-47; Matches 55; Conservative 0; Mismatches 0; Indels
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/note= "ATP/GTP binding site (p-loop)"
176..187
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/note= "ATP pyrophosphatase PP-motif"
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27
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Modified·site
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AAW70494
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US5817482-A.

Claim 11; SEQ ID No 2912; 2922pp; English.

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97US-0041276
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97US-0048160
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Best Local Similarity 100.
Matches 38; Conservative
                 (NIRA ) UNITIKA LTD.
(HUMA-) ZH HUMAN SCI
                                                                WPI; 1999-451549/38.
N-PSDB; AAX84897.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Misc-difference 625
                                                                                                                                                                                                                                                                                         624 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  25-MAR-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             W09842738-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19-MAR-1998;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1997;
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                                                                                                                                                                                                                                                                                           Sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               30-MAY-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10-MAY-
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 12
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    As The present sequence represents a human disease related nucleotide
kinase-2 (DRNK-2) protein sequence: The DNKR-2 encoding DNA sequence
consists identified in Incyte Clone 37887 from the lung tissue cDNA
consists identified in Incyte Clone 37887 from the lung tissue cDNA
consists identified in Incyte Clone 37887 from the lung tissue cDNA
consists in Incyte Clone 37887 from the lung tissue cDNA
consists in Incyte Clone 37887 from the invention
consists in Incyte Clone 37887 from the Incyte Clone
consists in Incyte Clone 37887 from the Incyte Clone
consists in Incyte Clone 37887 from the Clone 37887 from 4787 from 478
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                                                                                                                                                                                                                                                         caused by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ;
                                                                                                                                                                                                                                   Nucleic acids encoding de:oxy:guanosine kinase - useful for recombinant production of the enzyme for treating diseases callack of the enzyme e.g. cancers caused through loss of enzyme
                                                                                                                                                  Hillman JL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 624;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 57
                                                                                                                                                  Guegler KJ, . Hawkins .PR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6.2%; Score 38; DB 19;
100.0%; Pred. No. 3e-29;
tive 0; Mismatches 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Human APS kinase/ATP sulphurylase protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APS kinase/ATP sulphurylase; human; PAPS
                                                                                                                                                                                                                                                                                                              Examples; Fig 2A-2G; 53pp; English.
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                                                97US-0879561
                                                                                97US-0879561
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 6.2%
Best Local Similarity 100.(
Matches 38; Conservative
                                                                                                                (INCY-) INCYTE PHARM INC.
                                                                                                                                                  Corley NC,
                                                                                                                                                                                 WPI; 1998-556388/47.
N-PSDB; AAV33482.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     624 AA;
                                                20-JUN-1997;
                                                                                20-JUN-1997;
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              06-OCT-1998
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                                                                                                                                                  Bandman O,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sedneuce
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                                                                                                                                                                                                                                                                                         Function
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qq
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 immune system; asthma; lymphocytic disease; brain; hepatic; lymphoma; inflammation; ischaemic shock; Alzheimer's disease; restenosis; AIDS; cognitive disorder; schickenia; no besity; osteoclast; thymus; osteoporosis; arthritis; testis; lung; thyroiditis; thyroid; digestion; endocrine; metabolism; regulation; malabsorption; gastritis; neoplasm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                           This sequence is the human-derived APS kinase/ATP.sulphurylase of the invention. The enzyme may be used to prepare 3'-phosphoadenosine 5'-phosphosulphate (PAPS) on a large scale.
                                                                                                                                                New human-derived APS kinase/ATP sulfurylase gene - useful for
large scale preparation of 3'-phosphoadenosine 5'-phosphosulfate
(PAPS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6.2%; Score 38; DB 20; Length 624; 100.0%; Pred. No. 3e-29; tive 0; Mismatches 0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Human secreted protein encoded by gene 76 clone HOSFD58.
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SHINKO ZAIDAN.
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                                                                                                                                                                                                                                                                                                                                        Claim 1; Page 6-7; 9pp; Japanese.
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97US-0040161.
97US-0040162.
97US-0040163.
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97US-0040334.
97US-0040336.
97US-0040626.
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970S-0048964.
970S-0048974.
970S-0049610.
970S-0051926.
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97US-0043568.
97US-0043569.
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97US-0043312.
97US-0043313.
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97US-0056632.
97US-0056636.
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                                                                                                                                                                                                                                                                           11-APR-1997
                                                                                                                                                                                                                                                                                         11-APR-1
                                                                                                                                                                                                                                                                                                                                    This sequence represents a secreted human protein encoded by the generate clone detailed in the descriptor line. The gene can be used to generate fusion proteins by linking to the gene to a human immunoshoulin FC portion (e.g. AAX00602) for increasing the stability of the fused protein as compared to the human protein only.

The invention relates to 8 novel genes and their fragments (nucleic raid sequences: AAX00611-X00724; amino acid sequences AAX06041)

Which are useful for preventing, treating or ameliorating medical conditions can be diagnosed by determining the presence of mutations in the new polynucleotides. Becific uses are described for each of the 87 polynucleotides, based on which tissues they are most highly expressed in (see AAX00611 for described uses)
                                                                                                                                                                                                                                                       New isolated human genes and the secreted polypeptides they encode useful for diagnosis and treatment of e.g. cancers, neurological disorders, immune diseases, inflammation or blood disorders
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6.2%; Score 38; DB 20; Length 625; larity 100.0%; Pred. No. 3e-29; Conservative 0; Mismatches 0; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Human; secreted protein; testis; tumour; foetal brain tissue;
                                                                                                                                                                          Ni, J, Olsen HS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0; ; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        fusion protein; cancer; central nervous system; seizure; diagnosis; neurodegenerative disease.
                                                                                                                                                            Florence KA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Fragment of human secreted protein encoded by gene 14.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         30 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 67,
                                                                                                                                                           R, Ferrie AM, E
DW, Moore PA,
, Young P;
                                                                                                                                                                                                                                                                                                                  Claim 11; Page 313-315; 385pp; English.
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                                                                                                                                                                        Lafleur DW
                                                                                                                                                            Ebner R,
                                         970S-0048350.
970S-0048351.
970S-0048352.
970S-0048355.
970S-0054804.
                                                                                                                                (HUMA-) HUMAN GENOME SCI INC
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    97US-0048186
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97US-0048188
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                                                                                                                                                         Brewer LA, Duan R,
Greene JM, Hu JS, L
Rosen CA, Ruben SM,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
les 38; Conservat
                                                                                                                                                                                                                WPI; 1999-070066/06.
N-PSDB; AAX00686.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         625 AA;
                                         30-MAY-1997;
30-MAY-1997;
30-MAY-1997;
30-MAY-1997;
05-AUG-1997;
30-MAY-1997;
30-MAY-1997;
30-MAY-1997;
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Matches
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22-AUG-1

22-AUG-

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Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                            Arabidopsis thaliana protein fragment SEQ ID NO: 55117.
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99US-0139463.
99US-0139750.
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99US-0123548
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99US-0132863
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99US-0134219
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99US-0138847
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99US-0139456
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18-OCT-2000 (first entry)
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                                                                                   termination sequence
                                                                                                                Arabidopsis thaliana
                                                                                                                                         EP1033405-A2
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 This sequence represents a fragment of a secreted human protein encoded by the nucleic acid molecule designated Gene 14 (AAV59524).

The gene can be used to generate fusion proteins by linking to the gene to a bunan immunoglobulin Fc portion (e.g. AAV59502) for increasing the stability of the fused protein as compared to the human protein only.

The invention relates to 186 novel genes and their fragments (nucleic acid sequences: AAV59511-V59812; amino acid sequences AAW77711-W75026) which are useful for preventing, freating or ameliorating medical conditions e.g. by protein or gene therapy. Also, pathological conditions e.g. by protein or gene therapy. Also, pathological conditions e.g. by protein or gene therapy. Also, pathological conditions e.g. by protein or gene therapy. Also, pathological conditions e.g. by protein or gene therapy. Also, pathological conditions e.g. by protein or gene therapy. Also, pathological conditions e.g. by protein or gene therapy. Also, pathological conditions by determining the presence of mutations in the new polynucleotides. Specific uses are described for each of the 186 polynucleotides, based on which tissues they are most highly expressed in (see AAV59511 for described uses).
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her CL, Florence KA,
Y, Moore PA, Ni J,
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Kyaw H,
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Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter; termination sequence.
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Gaps

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PR 15-SEP-1999; 9905-0154019
PR 22-SEP-1999; 9905-0154019
PR 22-SEP-1999; 9905-0154019
PR 22-SEP-1999; 9905-0155486
PR 22-SEP-1999; 9905-0155486
PR 24-SEP-1999; 9905-0155486
PR 24-SEP-1999; 9905-0155596
PR 04-OCT-1999; 9905-015753
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PR 14-OCT-1999; 9905-0159295
PR 14-OCT-1999; 9905-0159295
PR 12-OCT-1999; 9905-0159296
PR 21-OCT-1999; 9905-015996
PR 21-OCT-1999; 9905-015996
PR 21-OCT-1999; 9905-015996
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PR 22-OCT-1999; 9905-0160767
PR 22-OCT-1999; 9905-0160768
PR 22-OCT-1999; 9905-0160789
PR 22-OCT-1999; 9905-0160989
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PR 25-OCT-1999; 9905-0161406
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PR 26-OCT-1999; 9905-0161406
PR 26-OCT-1999; 9905-0161992
PR 26-OCT-1999; 9905-0161993
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Search completed: May 30, 2003, 12:30:13 Job time: 75 secs

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Database :

Issued\_Patents\_AA:\*
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## SUMMARIES

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### ALIGNMENTS

RESULT 1 (US-09-149-476-635 ); Sequence 635, Application US/09149476 ); Patent No. 6420526 ); GENERAL INFORMATION: ); APPLICANT: Rosen et al. ); TITLE OF INVENTION: 186 Human Secreted proteins ); FILE REFERENCE: P2002P1								
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LICATION NUMBER: 60/056,874
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                                                                                                                                                                                                  APPLICATION NUMBER: 60/048,974
                                                                                                                                                                                                                                                                                                                                               ICATION NUMBER: 60/056,893
                                                                                                                                                                                                                                                                                                                                                                                   ICATION NUMBER: 60/056,630
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NG DATE: 1997-08-22
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ING DATE: 1997-08-22
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DATE: 1997-04-1
                                                                                                                                            ILING DATE: 1997-04-1
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100.0%; Pred. No. c...
0; Mismatches
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                                                                                                                                                                                                             APPLICATION NUMBER: 60/047,501
FILING DATE: 1997-05-23
APPLICATION NUMBER: 60/043,670
FILING DATE: 1997-04-11
APPLICATION NUMBER: 60/056,632
FILING DATE: 1997-08-22
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APPLICATION NUMBER: 60/056, 905
SILING DATE: 1997-06-22
APPLICATION NUMBER: 60/048, 964
APPLICATION NUMBER: 60/048, 964
ILING DATE: 1997-05-23
PPLICATION NUMBER: 60/047,594
ILING DATE: 1997-05-23
FPLICATION NUMBER: 60/047,589
ILING DATE: 1997-05-23
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TLING DATE: 1997-08-22
PPLICATION NUMBER: 60/056,875
TLING DATE: 1997-08-22
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EARLIER FILING DATE: 1997-06-13
EARLIER APPLICATION NUMBER: 60/061,060
EARLIER FILING DATE: 1997-10-02
                                                                               PPLICATION NUMBER: 60/047,593
                                                                                                                                                              ILING DATE: 1997-04-11
PPLICATION NUMBER: 60/043,576
ILING DATE: 1997-04-11
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LING DATE: 1997-08-22
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ILING DATE: 1997-08-22
PPLICATION NUMBER: 60/056,881
ILING DATE: 1997-08-22
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LING DATE: 1997-08-22
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LING DATE: 1997-09-05
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                                                                                                                                                PPLICATION NUMBER: 60/043,578
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Patent No. 5817482
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Hillman, Jenn
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Best Local Similarity 100.
Matches 55; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LING DATE: 1997
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CORRESPONDENCE ADDRESS:
ADDRESSEE: Incyte Ph
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APPLICANT: Bandma
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Length 624;
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Pred. No. 8e-29;
0; Mismatches 0; Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EARLIER APPLICATION NUMBER: PCT/US98/04493
EARLIER FILING DATE: 1998-03-06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT APPLICATION NUMBER: US/09/149,476 CURRENT FILING DATE: 1998-09-08
                                                                                                       PF-0325 US
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EARLIER FILING DATE: 1997-03-07
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EARLIER APPLICATION NUMBER: 60/040,333
EARLIER FILING DATE: 1997-03-07
EARLIER FILING DATE: 1997-03-07
EARLIER FILING DATE: 1997-03-07
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EARLIER FILLING DATE: 1997-03 -07
EARLIER APPLICATION NUMBER: 60/040,334
EARLIER FILLING DATE: 1997-03-07
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EARLIER APPLICATION NUMBER: 60/047,617
EARLIER APPLICATION NUMBER: 1997-05-23
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FILING DATE: 1997-03-07
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EARLIER FILING DATE: 1997-03-07
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EARLIER FILING DATE: 1997-05-23
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FILING DATE: 1997-05-23
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APPLICATION NUMBER: 60/047,633
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EARLIER APPLICATION NUMBER: 60/047,583
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APPLICATION NUMBER: 60/047,503
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                                                                                                                                                                                                                                                                                                                                                                                                                             6.2%; Scillarity 100.0%; P. Conservative 0;
                   FILING DATE:
ATTORNEY/AGENE INFORMATION:
NAME: Billings, Lucy J.
REGISTRATION NUMBER: 36,749
                                                                                                                        TELECOMMUNICATION INFORMATION:
TELEPHONE: 415-855-0555
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                                                                                                                                                                                                                                             LENGTH: 624 amino acids
TYPE: amino acid
STRANDEDNES: single
TOPOLOGY: linear
IMMEDIATE SOURCE:
                                                                                                   REFERENCE/DOCKET NUMBER:
                                                                                                                                            TELEPHONE: 415-855-05: TELEFAX: 415-845-4166
                                                                                                                                                                                                        INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                SEQUENCE CHARACTERISTICS
  APPLICATION NUMBER:
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                                                                                                                                                                                                                                                                                                                                                  ; LIBRARY: GenBank
; CLONE: 1109676
US-08-879-561-9
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Best Local Similarity
Matches 38; Conserv
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APPLICANT: Hillman, Jennifer L.
APPLICANT: Hawkins, Phillip R.
APPLICANT: Guegler, Karl J.
APPLICANT: Corley, Nail C.
TITLE OF INVENTION: DISEASE RELATED NUCLEOTIDE KINASES
CORRESPONDENCE ADDRESS:
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Pred. No. 8e-29;
0; Mismatches (
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APPLICATION NUMBER: US/08/879,561
FILING DATE: Herewith
                                                                                                                                                               SOFTWARE: FastSEO for Windows Version 2.0 CURRENT APPLICATION DATA:
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                                                                                                                                                                                                      US/08/879,561
                                                                                                                                                                                                                                                                                                                      ATTORNEY AGENT INFORMATION:
NAME: Billings, Lucy J.
REGISTRATION UNMBER: 36,749
REFRENCE/DOCKET NUMBER: PF-0
TELECOMMUNICATION INFORMATION:
TELEPHONE: 415-855-0555
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Best Local Similarity 100.0%; Pi
Matches 38; Conservative 0;
                                                                                                   MEDIUM TYPE: Diskette
COMPUTER: IBM Compatible
OPERATING SYSTEM: DOS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH: 624 amino acids
TYPE: amino acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
                                                                                                                                                                                                                       Herewith
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APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              single
                                                        ZIP: 94304
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskett
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PRIOR APPLICATION DATA:
                                                                                                                                                                                                        APPLICATION NUMBER:
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CLONE: 373887
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CITY: Palo Alto
STATE: CA
Palo Alto
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                                        COUNTRY:
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PLICATION NUMBER: 60/047,500
LING DATE: 1997-05-23
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PLICATION NUMBER: 60/047,587
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APPLICATION NUMBER: 60/047,492
FILING DATE: 1997-05-23
                                                                                                                                                                                                                                           LICATION NUMBER: 60/047,582
                                                                                                                                                                                                                                                                        ILLING DATE: 1997-05-23
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LICATION NUMBER: 60/047,632
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LICATION NUMBER: 60/043,315
LICATION NUMBER: 60/047,581
                                APPLICATION NUMBER: 60/047,584 FILING DATE: 1997-05-23
                                                                                                                                                                      PPLICATION NUMBER: 60/047,598
                                                                                                                                                                                                         ICATION NUMBER: 60/047,613
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ING DATE: 1997-04-11
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LICATION NUMBER: 60/043,313
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FILING DATE: 1997-08-22
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LICATION NUMBER: 60/048,974
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TLING DATE: 1997-08-22
PELICATION NUMBER: 60/056,880
TLING DATE: 1997-08-22
PPLICATION NUMBER: 60/056,894 ING DATE: 1997-08-22 LICATION NUMBER: 60/056,636 ING DATE: 1997-08-22 ILING DATE: 1997-08-22
PPLICATION NUMBER: 60/047,595
ILING DATE: 1997-05-23
PPLICATION NUMBER: 60/047,599 LING DATE: 1997-05-23 PLICATION NUMBER: 60/047,585 PPLICATION NUMBER: 60/056,888 ILING DATE: 1997-08-22 ILING DATE: 1997-08-22 PPLICATION NUMBER: 60/057,761 ILING DATE: 1997-08-22 LICATION NUMBER: 60/047,588 ING DATE: 1997-05-23 PLICATION NUMBER: 60/047,590 LING DATE: 1997-05-23 TELLIC DATE: 1997-05-23
PPLICATION NUMBER: 60/047,614 PPLICATION NUMBER: 60/056,875 ILING DATE: 1997-08-22 PPLICATION NUMBER: 60/056,879 PPLICATION NUMBER: 60/056,911 LICATION NUMBER: 60/056,874 LCATION NUMBER: 60/056,910 LICATION NUMBER: 60/056,864 JICATION NUMBER: 60/056,631 NG DATE: 1997-08-22 LICATION NUMBER: 60/056,845 PLICATION NUMBER: 60/056,892 ICATION NUMBER: 60/047,586 60/047,589 PPLICATION NUMBER: 60/047,593 PLICATION NUMBER: 60/043,578 ILING DATE: 1997-04-11 PPLICATION NUMBER: 60/043,576 PPLICATION NUMBER: 60/043,670 PPLICATION NUMBER: 60/056,632 NG DATE: 1997-08-22 ICATION NUMBER: 60/056,664 APPLICATION NUMBER: 60/056,876 PPLICATION NUMBER: 60/056,909 ICATION NUMBER: 60/056,862 G DATE: 1997-08-22 CATION NUMBER: 60/056,887 PPLICATION NUMBER: 60/047,594 PPLICATION NUMBER: 60/047,501 PPLICATION NUMBER: 60/056,881 997-08-22 LING DATE: 1997-08-22 997-08-22 997-05-23 997-05-23 997-05-23 997-08-22 997-05-23 997-05-23 997-05-23 997-08-22 997-08-22 997-08-2 997-04-1 1997-08-2 1997-08-2 -80-997-04-1 -80-266 LICATION NUMBER: LING DATE: 1 LING DATE: 1 LING DATE: LING DATE: LING DATE: LING DATE: EARLIER I EARLIER I EARLIER I EARLIER I EARLIER / EARLIER / EARLIER / EARLIER / EARLIER EARLIER EARLIER EARLIER EARLIER SARLIER ARLIER

APPLICATION NUMBER: 60/056,908

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Patent No. 6338966
GENERAL INFORMATION:
APPLICANT: Allen, Steve
APPLICANT: Anderson, Shawn
APPLICANT: Ralos, Carl
APPLICANT: Ralski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
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APPLICANT: Anderson, Shawn
APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
CURRENT REPLICATION UNMER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
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                                                                                                          Length 133;
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9.8e-14;
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0; Mismatches
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                                                                                                            Query Match 3.6%; Sc.
Best Local Similarity 100.0%; P.
Matches 22; Conservative 0;
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Best Local Similarity
                        ; TYPE: PRT; ORGANISM: Zea mays US-09-346-408-2
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US-09-346-408-11
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LENGTH: 133
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APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
APPLICANT: Rafalsk1, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
TITLE OF INVENTION GENES ENCODING SULFAR APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEO ID NOS: 12
SOFTWARE: MICROSOFT Office 97
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TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
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6.3e-28;
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CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
SEQ ID NO 2
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                                                                                  EARLIER FILING DATE: 1997-09-05
EARLIER APPLICATION UNDBER: 60/056,884
EARLIER FILING DATE: 1997-08-22
EARLIER APPLICATION NUMBER: 60/057,669
EARLIER PILING DATE: 1997-09-05
EARLIER FILING DATE: 1997-06-13
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EARLIER APPLICATION NUMBER: 60/061,060
EARLIER FILING DATE: 1997-10-02
                                                              APPLICATION NUMBER: 60/057,650
                        60/048,964
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GENERAL INFORMATION:
                   PLICATION NUMBER: 60/
LING DATE: 1997-06-06
FILING DATE: 1997-08-22
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APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
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APPLICANT: Falco, Carl
APPLICANT: Rafaleson, Carl
APPLICANT: Refaleson, Carl
APPLICANT: Refaleson, Carl
APPLICANT: Refaleson, Carl
TITLE OF INVENTION SIGNED Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
CURRENT PELICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
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TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
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100.0%; Pred. No. 3.6e-13;
iive 0; Mismatches 0;
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CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEO ID NOS: 12
SOFTWARE: Microsoft Office 97
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    415-855-0555
415-845-4166
                                                               INFORMATION FOR SEQ ID NO: 3
SEQUENCE CHARACTERISTICS:
LENGTH: 610 amino acids
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ORGANISM: Triticum aestivum
                                                                                                                                TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
IMMEDIATE SOURCE:
LIBRARY: GENBANK
CLONE: 705385
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Best Local Similarity 100.0
Matches 21; Conservative
                                                                                                                                                                                                                                                                                                                              Similarity 100.
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APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILE REFERENCE: BB-1167-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Allen, Steve
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
      TELEPHONE:
                                                                                                                                                                                                                                                                                                          Query Match
Best Local Sim:
Matches 22;
                                                                                                                                                                                                                                                                 US-08-879-561-10
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                                                                                                                                                                                                                                                                          APPLICANT: REFEISK, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: JULY 14, 1998
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TITLE OF INVENTION: DISEASE RELATED NUCLEOTIDE KINASES
NUMBER OF SEQUENCES: 12
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OPERATING SYSTEM: DOS
SOFTWARE: FastSEQ for Windows Version 2.0
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Incyte Pharmaceuticals, Inc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TORNEY AGENT TO THINGS LUCY J. REGISTRATION NUMBER: 36,749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICATION NUMBER: US/08/879,561
FILING DATE: Herewith
  NADAVFAFQLRNPVHNGHALLM 422
                           241 NADAVFAFQLRNPVHNGHALLM 262
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                                                                                                                                                  Sequence 6, Application US/09346408B Patent No. 6338966.
GENERAL INFORMATION:
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Patent No. 5817482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jennifer L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hawkins, Phillip R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE/DOCKET NUMBER: PI
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Best Local Similarity 100.0%;
Matches 22; Conservative 0
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: Microsoft Office 97 SEQ ID NO 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CURRENT APPLICATION DATA:
                                                                                                                                                                                                                  APPLICANT: Allen, Steve
APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Diskett
COMPUTER: IBM Compat
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ) ORGANISM: Glycine max US-09-346-408-6
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R APPLICATION NUMBER: 60/047,612
RR APPLICATION NUMBER: 60/047,612
ER FILING DATE: 1997-05-23
ER FILING DATE: 1997-05-23
ER FILING DATE: 1997-05-23
ER FILING DATE: 1997-05-23
                         PLICATION NUMBER: 60/047,582
LING DATE: 1997-05-23
                                                                APPLICATION NUMBER: 60/047,596
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FILING DATE: 1997-04-11
APPLICATION NUMBER: 60/043,569
FILING DATE: 1997-04-11
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APPLICATION NUMBER: 60/043,312
FILING DATE: 1997-04-11
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FILING DATE: 1997-04-11
APPLICATION NUMBER: 60/043,672
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FILING DATE: 1997-04-11
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FILING DATE: 1997-08-22
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FILING DATE: 1997-08-22
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APPLICATION NUMBER: 60/056,880
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APPLICATION NUMBER: 60/056,874
FILING DATE: 1997-08-22
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FILING DATE: 1997-04-11
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FILING DATE: 1997-04-11
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FILING DATE: 1997-08-22
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APPLICATION NUMBER: 60/056,882
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APPLICATION NUMBER: 60/056,637
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FILING DATE: 1997-08-22
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FILING DATE: 1997-08-22
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FILING DATE: 1997-08-22
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APPLICATION NUMBER:
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                                                                                                                                             Gaps
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                                                                                                    Length 476;
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                                                                                               Query Match 3.4%; Score 21; DB 4; L
Best Local Similarity 100.0%; Pred. No. 2.8e-12;
Matches 21; Conservative 0; Mismatches 0;
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APPLICANT: Rosen et al.
TITLE OF INVENTION: 186 Human Secreted proteins
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FILING DATE: 1997-03-07
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APPLICATION NUMBER: 60/047,617
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                                                                                                                                                                               402 ADAVFAFQLRNPVHNGHALLM 422
                                                                                                                                                                                                     Sequence 637, Application US/09149476 Patent No. 6420526
                  TYPE: PRT ; ORGANISM: Arabidopsis thaliana US-09-346-408-12
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APPLICATION NUMBER:
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US-09-149-476-637
LENGTH: 476
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Mismatches

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12; Conservative

Matches

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FILING DATE: 1997-05-23
APPLICATION NUMBER: 60/043,578
FILING DATE: 1997-04-11
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FILING DATE: 1997-05-23
                                                                                                                                                                                                  LICATION NUMBER: 60/047,599
ING DATE: 1997-05-23
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FILING DATE: 1997-08-22
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APPLICATION NUMBER: 60/056,862
FILING DATE: 1997-08-22
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NG DATE: 1997-06-13
                                                                                                                        APPLICATION NUMBER: 60/057,761
                                                                                                                                                                                                                                       APPLICATION NUMBER: 60/047,588
                                                                                                                                                                                                                                                                            LICATION NUMBER: 60/047,585
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                                                                                                                                                                                                                                                                                                                                                    ICATION NUMBER: 60/047,590
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FILING DATE: 1997-08-22
APPLICATION NUMBER: 60/056,908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: 60/048,964
FILING DATE: 1997-06-06
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                                                                                         LICATION NUMBER: 60/056,892
                                                                                                                                                                                                                                                                                                                                                                                                                                                              60/047,593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PPLICATION NUMBER: 60/047,614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ICATION NUMBER: 60/047,501
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997-08-2
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2.0%; Score 12; DB 4; Length 27; 100.0%; Pred. No. 0.00015;

Query Match Best Local Similarity

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APPLICANT: Lynn Doucette-Stamm et al
TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO STAPHYLOCOCC
TITLE OF INVENTION: EPIDERMIDIS FOR DIAGNOSTICS AND THERAPEUTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
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                                                                                                                                                                                                                               FILE REFERENCE: GTC-007
CURRENT APPLICATION WUMBER: US/09/134,001C
CURRENT APPLICATION WUMBER: US 60/064,964
PRIOR APPLICATION NUMBER: US 60/064,964
PRIOR FILING DATE: 1997-11-08
PRIOR FILING DATE: 1997-11-08
NUMBER OF SEQ ID NOS: 5674
SEQ ID NO 4517
                                                                                                                       Sequence 4517, Application US/09134001C Patent No. 6380370
                                                                                                                                                                                                                                                                                                                                                                                                                    ; TYPE: PRT
; ORGANISM: Staphylococcus epidermidis
US-09-134-001C-4517
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Best Local Similarity 100.
                    2 LDGDNVRHGLNR 13
76 LDGDNVRHGLNR 87
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protein search, using sw model OM protein May 30, 2003, 12:32:25; Search time 49 Seconds Run on:

npdates/sec (without alignments)
1270.461 Million cell

Title: Perfect score:

US-09-898-1658-7 615 1 MSGIKKQKTENQQKSTNVVY......MAPKAWKVLTDYYRSEMDKN 615 Sequence:

OLIGO Gapop 60.0 , Gapext 60.0 Scoring table:

383519 seqs, 101223694 residues Searched:

10

Total number of hits satisfying chosen parameters: Word size :

31

Minimum DB seq length: 0 Maximum DB seq length: 20000000000

Post-processing: Listing first 1000 summaries

Database :

Published\_Applications\_AA:\*

/cgn2\_6/ptodata\_1/pubpaa\_VUSO8\_NEW\_PUB.pep: Cgn2\_6/ptodata\_1/pubpaa\_PCT\_NEW\_PUB.pep: /cgn2\_6/ptodata\_1/pubpaa\_VUSO6\_NEW\_PUB. /cgn2\_6/ptodata\_1/pubpaa\_VUSO6\_PUBCOMB.pep: /cgn2\_6/ptodata\_1/pubpaa\_VUSO7\_PUBCOMB.pep: /cgn2\_6/ptodata\_1/pubpaa\_VUSO7\_PUBCOMB.pep: /cgn2\_6/ptodata\_1/pubpaa\_VUSO7\_PUBCOMB.pep: /cgn2\_6/ptodata\_1/pubpaa\_VUSO7\_PUBCOMB.pep:

/cgn2\_6/ptodata/1/pubpaa/US08\_PUBCOMB.pep: /cgn2\_6/ptodata/1/pubpaa/US09\_NEW\_PUB.pep: /cgn2\_6/ptodata/1/pubpaa/US09\_PUBCOMB.pep: /cgn2\_6/ptodata/1/pubpaa/US60\_NEW\_PUB.pep: /cgn2\_6/ptodata/1/pubpaa/US60\_PUBCOMB.pep: /ptodata/1/pubpaa/US10\_NEW\_PUB.pep /ptodata/1/pubpaa/US10\_PUBCOMB.pep

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

		App	11, A	App	App	App	App	App	App	App	App	App	App	App	App	App	App	App	App	App
	ŭ			635,	196,	196,	196,	196,	244,	634,	332,	332,	332,	332,	340,	340,	340,	340,	339,	339,
	Description	Sequence 184,	Sequence 39981,	Sequence	Sequence	Sequence	Sequence	Sequence	Seguence 244	Sednence	Sequence									
	ID QI	US-09-974-298-184	US-09-864-761-39981	US-09-809-391-635	US-09-984-245-196	US-09-966-262-196	US-09-983-966-196	US-10-143-090-196	US-09-771-161A-244	US-09-809-391-634	US-09-984-245-332	US-09-966-262-332	US-09-983-966-332	US-10-143-090-332	US-09-984-245-340	US-09-966-262-340	US-09-983-966-340	US-10-143-090-340	US-09-984-245-339	US-09-966-262-339
	DB	6	10	6	6	6	6	6	10	6	6	6	σ	9	6	6	6	6	6	6
	Query Match Length	619	65	174	624	624	624	624	624	36	45	45	45	45	41	41	41	41	37	37
ф	Query Match	35.9	10.6	8.9	6.2	6.2	6.2	6.2	6.2	5.9	4.6	4.6	4.6	4.6	3.3	3.3	3.3	3.3	2.8	2.8
	Score	221	65	55	38	38	38	38	38	36	28	28	28	28	20	20	20	20	17	17
	Result No.	-	2	e	4	5	9	7	80	σ	10	11	12	13	14	15	16	17	18	19

Sequence 339, App	Sequence 339, App	Seguence 153, App	Sequence 40, Appl	Sequence 40, Appl	Seguence 40, Appl	Sequence 637, App	Sequence 338, App	Sequence 338, App	Sequence 338, App	Sequence 338, App	Sequence 457, App
0S-09-983-966-339	US-10-143-090-339	US-09-771-161A-153	US-10-156-239-40	US-10-199-485-40	US-09-795-693-40	US-09-809-391-637	US-09-984-245-338	US-09-966-262-338	US-09-983-966-338	US-10-143-090-338	US-09-741-669-457
6	6	10	6	σ	10	6	6	6	6	6	10
37	37	20	162	162	162	27	39	39	39	39	201
2.8	2.8	2.3	2.3	2.3	2.3	2.0	2.0	2.0	2.0	2.0	1.6
17	17	14	14	14	14	12	12	12	12	12	10
20	21	22	23	24	25	26	27	28	29	30	31

#### ALIGNMENTS

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353
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QLRNPVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEE : 468
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                                                                                                                                                                                                                                                                                                                                                                                                                                                               349 TCTKHPHIKMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    529 PTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTRMRKLAREG
                                                                                                                                                                                                                                                                                                                                                                                                                                            289 DGVINMSIPIVLPVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGT
                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                        Length 619;
                                                                                                                                                                                                                                                                                                 NAME/KEY: misc_feature
; OTHER INFORMATION: Incyte ID No. US20020156263A1 1420940CD1
US-09-974-298-184
                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                APPLICANT: Chen, Huei-Mei
TITLE OF INVENTION: GENES EXPRESSED IN BREAST CANCER
FILE REPERENCE: PA-0037 P
CURRENT APPLICATION NUMBER: US/09/974,298
CURRENT FILING DATE: 2001-10-04
PRIOR APPLICATION NUMBER: 60/238,331
PRIOR FILING DATE: 2000-05-10
NUMBER OF SEQ ID NOS: 194
SOFTWARE: PERL PROGram
                                                                                                                                                                                                                                                                                                                                                                    Score 221; DB 9; I
Pred. No. 1.6e-206;
O; Mismatches 1;
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ilarity 99.7%;
Conservative (
                                                                                                                                                                                                                                                   TYPE: PRT
ORGANISM: Homo sapiens
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Best Local Similarity
Matches 321; Conserv
                                     GENERAL INFORMATION
                                                                                                                                                                                                                 SEQ ID NO 184
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RESULT 2 US-09-864-761-39981 Sequence 39981, Application US/09864761 ; Patent No. US20020048763A1

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55 MSGIKKQKTENQQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGK 109
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                                                                                                                                                                                                                                                                                                          Prior application data removed - consult PALM or file wrapper NUMBER OF SEQ ID NOS: 761
SOFTWARE: PatentIn Ver. 2.0
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 8.9%; Score 55; DB 9; Length 174 Best Local Similarity 100.0%; Pred. No. 2e-45; Matches 55; Conservative 0; Mismatches 0; Indels
                                                                                                                                         Sequence 635, Application US/09809391
Publication No. US20030049618A1
GENERAL THFORMATION:
APPLICANT: Ruben et al.
TITLE OF INVENTION: 186 Human Secreted proteins
FILE REFERENCE: PZ002PB
CURRENT APPLICATION NUMBER: US/09/809,391
CURRENT FILING DATE: 2001-03-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Young et al.
TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: P2004P1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION NUMBER: US/09/984,245
CURRENT FILING DATE: 2001-10-29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R FILING DATE: 1998-03-19
R APPLICATION NUMBER: US 60/041,277
R APPLICATION NUMBER: US 60/041,277
R APPLICATION NUMBER: US 60/042,344
R FILING DATE: 1997-03-21
R APPLICATION NUMBER: US 60/041,276
R APPLICATION NUMBER: US 60/041,276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILING DATE: 1998-09-17
APPLICATION NUMBER: PCT/US98/05311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US 60/041,281
FILING DATE: 1997-03-21
APPLICATION NUMBER: US 60/048,094
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FILLING DATE: 1997-05-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: US 60/048,099
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FILING DATE: 1997-05-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 196, Application US/09984245
Patent No. US20020165374A1
GENERAL INFORMATION:
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PRIOR APPLICATION NUMBER: 09/154,707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE: 1997-05-30
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                                                                                                                                                                                                                                                                                                                                                                                                                                  ; ORGANISM: Homo sapiens
US-09-809-391-635
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SPFAK 65
  SPFAK 127
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LENGTH: 174
123
                                        61
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                                                                           APPLICANT: Chen, Wensheng
TITLE OF INVENTION: HUMAN GENOME-DERIVED SINGLE EXON NUCLEIC ACID PROBES USEFUL FOR
TITLE OF INVENTION: GENE EXPRESSION ANALYSIS BY MICROARRAY
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BE292722.1, EVALUE 4.00e-32
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BONE MARROW, SIGNAL = 1.
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SEQ ID NO 39981
LENGTH: 65
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IN BRAIN, SIGNAL = 1
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                                                                                                                                         FILE REFERENCE: Aeomica-X-1
CURRENT APPLICATION NUMBER: US/09/864,761
CURRENT FILING DATE: 2001-05-23
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                                                                                                                                                                                                                                                                                                                                                                                                                                                   PLICATION NUMBER: PCT/US01/00667
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FILING DATE: 2001-01-30
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FILING DATE: 2001-01-30
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LING DATE: 2001-01-30
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APPLICATION NUMBER: US 60/207,456
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APPLICATION NUMBER: US 60/236,359
                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: US 60/180,312
                                                                                                                                                                                                                                                                                    APPLICATION NUMBER: US 09/632,366
FILING DATE: 2000-08-03
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APPLICATION NUMBER: US 60/234,687
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FILING DATE: 2001-01-29
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                                                              Hanzel, David K.
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COTHER INFORMATION:
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Best Local Similarity
Matches 65; Conserv
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FILING DATE: 1997-05-30 APPLICATION NUMBER: US 60/048,186

FILING DATE: 1997-05-30

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30 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKIT 67
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TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: PZ004P1
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CURRENT APPLICATION NUMBER: US/09/983,966
CURRENT APPLICATION NUMBER: 09/154,707
PRIOR FILING DATE: 1998-09-17
PRIOR FILING DATE: 1998-09-17
PRIOR FILING DATE: 1998-03-19
PRIOR FILING DATE: 1997-03-21
PRIOR PELICATION NUMBER: US 60/041,261
PRIOR APPLICATION NUMBER: US 60/048,094
PRIOR APPLICATION NUMBER: US 60/048,180
PRIOR FILING DATE: 1997-05-30
PRIOR PILING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,188
PRIOR FILING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,188
PRIOR FILING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,188
PRIOR FILING DATE: 1997-05-30
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US-09-966-262-196
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Best Local Similarity 100.0%; Pred. No. 2.1e-28;
Matches 38; Conservative 0; Mismatches 0;
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TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: PZ004P1
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CURRENT FILING DATE: 2001-10-01
PRIOR APPLICATION NUMBER: US 09/154,707
PRIOR FILING DATE: 1998-09-17
PRIOR FILING DATE: 1998-03-19
PRIOR PILING DATE: 1998-03-19
PRIOR PELICATION NUMBER: PCT/US98/05311
PRIOR PELICATION NUMBER: US 60/041,277
PRIOR PELING DATE: 1997-03-21
PRIOR APPLICATION NUMBER: US 60/041,276
PRIOR FILING DATE: 1997-03-21
PRIOR APPLICATION NUMBER: US 60/041,276
PRIOR PLICATION NUMBER: US 60/041,281
PRIOR PLICATION NUMBER: US 60/041,281
PRIOR PLICATION NUMBER: US 60/041,281
PRIOR PLICATION NUMBER: US 60/048,094
PRIOR PLING DATE: 1997-03-21
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
                                                                                   PRIOR AFPLICATION NUMBER: US 60/046,093
PRIOR APPLICATION NUMBER: US 60/048,131
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
PRIOR PELING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,150
PRIOR PLING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/054,804
PRIOR PLING DATE: 1997-06-05
PRIOR PLING DATE: 1997-06-05
PRIOR PLING DATE: 1997-06-05
PRIOR PLING DATE: 1997-08-05
APPLICATION NUMBER: US 60/048,069
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FILING DATE: 1997-05-30
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FILING DATE: 1997-05-30
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ORGANISM: Homo sapiens
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                 PRIOR APPLICATION NUMBER: US 60/048,099
PRIOR APPLICATION NUMBER: US 60/048,185
PRIOR FILING DATE: 1997-05-30
PRIOR PELING DATE: 1997-05-30
PRIOR PELING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,069
PRIOR PILING DATE: 1997-05-30
PRIOR PILING DATE: 1997-08-05
PRIOR PILING DATE: 1997-08-19
US 60/048,099
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SEQ ID NO 196
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  0; Indels
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                                            20 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 57
                                                                   30 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 67
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Pred. No. 2.1e-28;
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                                                                                                                                                                                                                                                           APPLICANT: LEVINE, et al.,
TITLE OF INVENTION: VARIANTS OF PROTEIN KINASES
FILE REFERENCE: 802620-2005.1
CURRENT APPLICATION NUMBER: US/09/771,161A
CURRENT FILING DATE: 2001-01-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Ruben et al.
TITLE OF INVENTION: 186 Human Secreted proteins
FILE REFERENCE: P2002P2
CURRENT APPLICATION UNMER: US/09/809,391
CURRENT FILING DATE: 2001-03-16
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100.0%; Pred. No. 2...
0; Mismatches
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  0; Mismatches
                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION NUMBER: 09/724,676
PRIOR FILING DATE: 2000-11-28
PRIOR APPLICATION NUMBER: 136776
PRIOR APPLICATION NUMBER: 136776
PRIOR APPLICATION NUMBER: 135619
PRIOR FILING DATE: 2000-04 12
NUMBER OF SEQ ID NOS: 273
SOFTWARE: Patentin version 3.0
                                                                                                                                                                                          Sequence 244, Application US/09771161A Patent No. US20020110811A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; Sequence 634, Application US/09809391
; Publication No. US20030049618A1
; GENERAL INFORMATION:
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  38; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Similarity 100.
Matches 38; Conservative
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Matches 36; Conservative
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ORGANISM: Homo sapiens
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CORGANISM: Homo sapiens
US-09-809-391-634
                                                                                                                                                                          US-09-771-161A-244
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  Matches
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Best Local Similarity 100.0%; Pred. No. 2.1e-28;
Matches 38; Conservative 0; Mismatches 0;
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TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: PSO04P1
CURRENT APPLICATION NUMBER: US/10/143,090
CURRENT FILING DATE: 2002-05-13
PRIOR FILING DATE: 1998-09-17
NUMBER OF SEQ ID NOS: 343
SOFTWARE: PATENTIN Ver. 2.0
                                                   PRIOR APPLICATION NUMBER: US 60/048, 937
PRIOR FILING DATE: 1997-05-30
PRIOR PLICATION NUMBER: US 60/048, 186
PRIOR PRIOR DATE: 1997-05-30
PRIOR PRIOR DATE: 1997-05-30
PRIOR PRIOR DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048, 186
PRIOR APPLICATION NUMBER: US 60/048, 069
PRIOR APPLICATION NUMBER: US 60/048, 069
PRIOR PRIOR DATE: 1997-05-30
PRIOR PRIOR DATE: 1997-05-30
PRIOR FILING DATE: 1997-05-30
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Pred. No.
APPLICATION NUMBER: US 60/048,135
                                                                                                                                                                                                                                                                                                                                                                                                                                               LING DATE: 1997-05-30
PLICATION NUMBER: US 60/048,160
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APPLICATION NUMBER: US 60/048,355
                                          APPLICATION NUMBER: US 60/050,937
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APPLICATION NUMBER: US 60/048,154
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LICATION NUMBER: US 60/048,351
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100.0%;
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NUMBER OF SEQ ID NOS: 343
SOFWARE: Patentin Ver. 2.0
SEQ ID NO 196
EBNCTH: 624
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US-10-143-090-196
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Best Local Similarity
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APPLICANT: Young et al.
TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: P2004P1
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PRIOR APPLICATION NUMBER: US/05/311
PRIOR PILLING DATE: 1998-03-19
PRIOR APPLICATION NUMBER: PCT/US98/05311
PRIOR APPLICATION NUMBER: PCT/US98/05311
PRIOR APPLICATION NUMBER: US/06/041,277
PRIOR APPLICATION NUMBER: US/06/041,277
PRIOR APPLICATION NUMBER: US/06/041,276
PRIOR PLING DATE: 1997-03-21
PRIOR APPLICATION NUMBER: US/06/041,281
PRIOR PLING DATE: 1997-03-21
PRIOR APPLICATION NUMBER: US/06/048,094
PRIOR FILING DATE: 1997-03-30
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US/06/048,186
PRIOR PLING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US/06/048,187
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US/06/048,186
PRIOR PLING DATE: 1997-05-30
PRIOR PLING DATE: 1997-05-3
                                                                                                                                                                                                                                                                  CURRENT APPLICATION NUMBER: US/09/966,262 CURRENT FILING DATE: 2001-10-01
                                                                                      Sequence 332, Application US/09966262 Publication No. US20030050461A1
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SOFTWARE: PatentIn Ver.
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CORGANISM: Homo sapiens
US-09-966-262-332
                                                                                                                                          GENERAL INFORMATION:
                                                          US-09-966-262-332
                                                                                            Sequence 332,
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hes 0;
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100.0%; Pred. No. 1.2e-1
APPLICANT: Young et al. FITLE OF INVENTION: 87 Human Secreted Proteins
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4.6%; Score 28; DB
Best Local Similarity 100.0%; Pred. No. 1.2
Matches 28; Conservative 0; Mismatches
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PRIOR FILING DATE: 1997-05-30
PRIOR FILING DATE: 1997-05-30
PRIOR FILING DATE: 1997-05-30
PRIOR FILING DATE: 1997-06-30
PRIOR FILING DATE: 1997-08-05
PRIOR FILING DATE: 1997-08-05
PRIOR FILING DATE: 1997-08-19
                                                                            CURRENT APPLICATION NUMBER: US/09/984,245 CURRENT FILING DATE: 2001-10-29
                                                                                                                                 PRIOR FILLING DATE: 1998-09-17
PRIOR FILLING DATE: 1998-09-17
PRIOR APPLICATION NUMBER: PCT/US98/05311
                                                                                                                                                                                                                                                                                                                                                                                                   TILING DATE: 1997-03-21
APPLICATION NUMBER: US 60/041,281
FILING DATE: 1997-03-21
APPLICATION NUMBER: US 60/048,094
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APPLICATION NUMBER: US 60/048,186
FILING DATE: 1997-05-30
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APPLICATION NUMBER: US 60/041,277
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IOR APPLICATION NUMBER: US 60/042,344
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APPLICATION NUMBER: US 60/041,276
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APPLICATION NUMBER: US 60/048,350
FILING DATE: 1997-05-30
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LICATION NUMBER: US 60/048,188
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APPLICATION NUMBER: US 60/050,937
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APPLICATION NUMBER: US 60/048,187
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APPLICATION NUMBER: US 60/048,099
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PRIOR FILING DATE: 1997-05-30
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APPLICATION NUMBER: US 60/048,131
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APPLICATION NUMBER: US 60/048,096
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PRIOR APPLICATION NUMBER: US 60/048,355
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PRIOR FILING DATE: 1997-05-30
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PRIOR FILING DATE: 1997-10-02
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; ORGANISM: Homo sapiens
US-09-984-245-332
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Score 28; DB 9; Length 45; Pred. No. 1.2e-19;

4.6%; S 100.0%;

Query Match Best Local Similarity

18 YQAHHVSRNKRGQVVGTRGGFRGCTVWL 45

20 YQAHHVSRNKRGQVVGTRGGFRGCTVWL 47

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100.0%; Pred. No. 1.2e-19;
tive 0; Mismatches 0;
                                                                                                 1.2e-19;
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APPLICANT: Young et al.
TILLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERNCE: P2004P1
CURRENT APPLICATION NUMBER: US/10/143,090
CURRENT FILING DATE: 2002-05-13
PRIOR PAPLICATION NUMBER: 09/154,707
PRIOR FILING DATE: 1998-09-17
NUMBER OF SEQ ID NOS: 343
SOFTWARE: PATCHIN VET: 2.0
                                                                          Score 28; DB 9;
Pred. No. 1.2e-1
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TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: PZ004P1
                                                                              Query Match 4.6%; Score 28; DB Best Local Similarity 100.0%; Pred. No. 1.5 Matches 28; Conservative 0; Mismatches
                                                                                                                                                                            18 YQAHHVSRNKRGQVVGTRGGFRGCTVWL 45
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CURRENT FILING DATE: 2001-10-29
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RICH APPLICATION NUMBER: 09/154,707
PRIOR FILING DATE: 1998-09-17
PRIOR APPLICATION NUMBER: PCT/US98/05311
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APPLICATION NUMBER: US 60/041; 276
FILING DATE: 1997-03-21
APPLICATION NUMBER: US 60/041, 281
FILING DATE: 1997-03-21
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APPLICATION NUMBER: US 60/048,094
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Patent No. US20020165374A1
GENERAL INFORMATION:
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Best Local Similarity 100.
Matches 28; Conservative
                         ORGANISM: Homo sapiens
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ORGANISM: Homo sapiens
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US-09-984-245-340
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US-10-143-090-332
                                         US-09-983-966-332
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LENGTH: 45
     TYPE: PRT
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IITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: P2004P1
   Mismatches
                                                        18 YQAHHVSRNKRGQVVGTRGGFRGCTVWL 45
                                       20 YQAHHVSRNKRGQVVGTRGGFRGCTVWL 47
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CURRENT FILING DATE: 2001-10-29
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PRIOR FILING DATE: 1998-09-17
PRIOR APPLICATION NUMBER: PCT/US98/05311
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APPLICATION NUMBER: US 60/041,277
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LICATION NUMBER: US 60/041,276
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UMBER: US 60/048,135
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LICATION NUMBER: US 60/048,095
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PPLICATION NUMBER: US 60/048,131
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APPLICATION NUMBER: US 60/048,096
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ING DATE: 1997-05-30
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PLICATION NUMBER: US 60/042,344
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LICATION NUMBER: US 60/041,281
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LICATION NUMBER: US 60/048,094
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LICATION NUMBER: US 60/050,937
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LICATION NUMBER: US 60/048,187
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PRIOR APPLICATION NUMBER: US 60/060,862
PRIOR FILING DATE: 1997-10-02
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APPLICATION NUMBER: US 60/048,154
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APPLICATION NUMBER: US 60/054,804
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                                                                                                                                                                    Sequence 332, Application No. US2 GENERAL INFORMATION
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iive 0; Mismatches 0;
PRIOR APPLICATION NUMBER: US 60/048,188 PRIOR FILING DATE: 1997-65-30 PRIOR PILING DATE: 1997-65-30 PRIOR PLING DATE: 1997-65-30 PRIOR PELING DATE: 1997-65-
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Best Local Similarity 100.
Matches 20; Conservative
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GENERAL INFORMATION:
APPLICANT: Young et al.
TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: P2004P1
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JRRENT FILING DATE: 2001-10-01
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FILING DATE: 1997-05-30
APPLICATION NUMBER: US 60/048,096
FILING DATE: 1997-05-30
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RIOR FILING DATE: 1998-03-19
RIOR PPLICATION NUMBER: US 60/041,277
RIOR FILING DATE: 1997-03-21
RIOR APPLICATION NUMBER: US 60/042,344
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FLING DARE: 1997-05-30
APPLICATION NUMBER: US 60/048,160
FILING DATE: 1997-05-30
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APPLICATION NUMBER: US 60/048,352
ELLING DATE: 1997-05-30
APPLICATION NUMBER: US 60/048,186
FILING DATE: 1997-05-30
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PRIOR APPLICATION NUMBER: US 60/054,804
PRIOR FILING DATE: 1997-08-05
PRIOR APPLICATION NUMBER: US 60/056,370
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PRIOR APPLICATION NUMBER: US 60/060,862
PRIOR FILING DATE: 1997-10-02
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RIOR APPLICATION NUMBER: US 60/041,276
RIOR FILING DATE: 1997-03-21
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PRIOR FILING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,350
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FILING DATE: 1997-05-30
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PRIOR APPLICATION NUMBER: US 09/154,707
PRIOR FILING DATE: 1998-09-17
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Publication No. US20030050461A1
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Best Local Similarity 100.09
Matches 20; Conservative
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SOFTWARE: Patentin Ver. 2.0
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; ORGANISM: Homo sapiens
US-09-984-245-340
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US-09-966-262-340
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Length 41; Indels

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OM protein - protein search, using sw model

May 30, 2003, 12:28:05; Search time 43 Seconds (without alignments) 1374.946 Million cell updates/sec Run on:

US-09-898-165B-7 615 1 MSGIKKQKTENQQKSTNVYY......MAPKAWKVLTDYYRSEMDKN 615 Title: Perfect score: Sequence:

Scoring table:

OLIGO Gapop 60.0 , Gapext 60.0

283224 seqs, 96134422 residues Searched:

10 Word size : Total number of hits satisfying chosen parameters:

32

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Listing first 1000 summaries

Database :

PIR\_73:\*
1: pir1:\*
2: pir2:\*
3: pir3:\*
4: pir4:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

	Description	adenylyl-sulfate k	sulfate adenylyltr		sulfate adenylyltr	$\vdash$	probable sulfate a	sulfate adenylyltr	sulfate adenylyltr	sulfate adenylyltr	sulfate adenylyltr	3'-phosphoadenosin	adenyly1-sulfate k	adenylylsulfate ki	adenylyl-sulfate k	adenyly1-sulfate k	probable adenyly1-	adenyly1-sulfate k	adenyly1-sulfate k	ATP sulfurylase, l	Sa	rn.	adenylyl-sulfate k	adenyly1-sulfate k	ப	44	•	_	adenosine 5'-phosp	adenosine 5'-phosp
SUMMARIES	ID	JW0087	S44079	S44267	T01204	JC4383	T08594	E71409	T52659	S44943	T14475	T24918	S74917	T50101	S47640	T06100	H95932	ZZZRNQ	E95320	G82672	C55228	H83472	S18729	T08076	A87433	AD3471	691	B65056	D91079	E85924
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ø	Query Match				3.6		3.4	3.4	3.4	3.4											₩.	1.8	1.8	1.8	1.8	1.8	1.6	1.6	1.6	1.6
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ALIGNMENTS  RESULT 1  TO 1.6 213 2 AF0408  ALIGNMENTS  RESULT 1  ANOUGH 1.6 215 2 F02062  ALIGNMENTS  RESULT 1  ANOUGH 2.2.1 A F0408  N. Allectrate names: adenosine 5'-Phosphosulfate kinase; p N. Contains: adenosine 6'-Phosphosulfate kinase; p N. Contains: adenosine 6'-Phosphosulfate kinase; p N. Contains: adenosine 6'-Phosphosulfate kinase; p N. Contains: adenosine 15'-Phosphosulfate kinase; p N. Contains: adenosine 15'-Phosphosulfate kinase; p N. Contains: adenosine 15'-Phosphosulfate kinase; p A. Tille: cDNA cloning, expression, and characterization A. Reference number: J050   Sequence_revision 23-Apr-1999   Featlesine 15'-Phosphosulfate kinase force   A. Crossion: J00087  A. Molecule type: mRNA A. Residues: 1-624 (AAAA) A. Residues: 1-624 (AAAA) A. Residues: 1-624 (AAAA) A. Residues: 1-624 (AAAAA) A. Residues: 1-624 (AAAAAA) A. Residues: 1-624 (AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	adenosine 5-phosph adenyly1-sulfate k adenyly1sulfate ki	ALIGNMENTS	2.7.1.25) - human e 5'-phosphosulfate kinase; PAPS s kinase (EC 2.7.1.25); sulfate adenylyltransferase (EC 2.7 an) ice_revision 23-Apr-1999 #text_change 03-Jun-2002 s 7; Sulko, M.; Takami, Y.; Nakayama, T.; Nakajima, H.,	of the human bifunctional	ylylsulfate kinase catalyzes the phosphorylation of adenylyls. at a adenylyltransferase catalyzes the reaction of sulfate and A 3'-phosphoadenosine-5'-phosphosulfate synthetase; adenylylsullational enzyme; nucleotide binding; nucleotidyltransferase; P-leotide-binding motif A (P-loop) tide-binding motif A (P-loop) at a adenylyltransferase homology <sat> categorylyltransferase homology SAT&gt; covalent) #status predicted</sat>	Score 38; DB 1; Length 624; Pred. No. 2e-30; ); Mismatches 0; Indels 0; Gaps 0; sPRGCTVWLTGLSGAGKTT 57	2.7.7.4) met3-1 - potato tato) vision 10-Nov-1995 #text_change 16-Jul-1999 itzer, L.; Riesmeier, J.W. ization of two cDNA clones encoding ATP-sulfurylases:	X75041; NID:g471342; PIDN:CAA52953.1; PID:g531495 enylyltransferase met3-1; sulfate adenylyltransferase homo_o ansferase adenylyltransferase homology <sat></sat>	re 22; DB 2; Length 424; ed. No. 4.6e-14; Mismatches 0; Indels 0; Gaps 0;
RESULT 1  JW0087  adenyly1-sulfate kinase (EC 2.7. adenyly1-sulfate kinase (EC 2.7. adenyly1-sulfate kinase (EC 2.7. adenyly1-sulfate kinase (EC 2.7. N. Alternate names: adenosine 5-rocession: JW0087  R; Yanagisawa, K.; Sakakibara, Y. Biosci. Biotechnol. Biochem. 62, Aritle: cDNA cloning, expression A; Mo1627  A; Managisawa, K.; Sakakibara, Y. Biosci. Biotechnol. Biochem. 62, Aritle: cDNA cloning, expression A; Mo1627  A; Mo162 Second Conning, expression C; Function: ASMF> A; Description: as adenyly1sulfate A; Description: S67497; Mu11, Description:	AH0856 AF0408 F82062	AL	phosphorse (EC vision Suike Suike	n, and 0:98312 NID:9	yltransf. yltransf. yadenosinome; nuclo kinasf. yltransf. yltransf.	SCOL 0; Pre- 0; M GGFRGC	2.7.7. otato) evision nitzer, rizatio	NID:9 ransfe ise ltrans	Scc Pr );
RESULT 1  JW608LT 23-Apr-1999 #sequence  C; Date: 23-Apr-1999 #sequence  JW608LT 1  JW608LT 1  JW608LT 1  JW608LT 2  JW608RT 1  JW608RT	0,00		1.7. 5'- ina ina _re_re	101D 101D 101D	fat	.28; 0.08 0.08 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03	(EC (Pc (Pc Lllm	)41;  ylt  era	. 68; ). 08
RESULT 1  JW00141-sulfate kinas adenyly1-sulfate kinas N, Alternate names: adenyly1ss C; Species: Homo sapler C; Species: Homo sapler C; Date: 23-Apr.1999 #s C; Accession: JW0087 A; Neference number: JW A; Reference number: JW A; Reference number: JW A; Reference number: JW A; Residues: 1-624 <akp 1-624="" <akl="" <akp="" a;="" accession:="" ader="" afp="" alilarii="" an="" animal="" as="" c;="" const<="" constrainly:="" cross-references:="" db="" description:="" domain:="" e="" f;="" function:="" genetics:="" isolation="" j-424="" j-624="" j1-409="" j25,="" nucleotid="" number:="" reference="" residues:="" rewords:="" reywords:="" s67497;="" st="" sulf="" sulfate="" superfamily:="" td="" title:=""><td>201 213 215</td><td></td><td>se (EC 2 snosine ilfate k is (man) sequence</td><td>expres 40087; N 4&gt; 3:AF033C</td><td>tate ade 3'-phos 10nal e 11ylsul 7lylsul 5tide-bi 6ate ade</td><td>5, 100 ervative RNKRGQVV</td><td>ferase (perosum sequence (R.; Wille) (P.; Wille) (P.;</td><td>» BL: ad</td><td>va t</td></akp>	201 213 215		se (EC 2 snosine ilfate k is (man) sequence	expres 40087; N 4> 3:AF033C	tate ade 3'-phos 10nal e 11ylsul 7lylsul 5tide-bi 6ate ade	5, 100 ervative RNKRGQVV	ferase (perosum sequence (R.; Wille) (P.;	» BL: ad	va t
RESULT 1  JW0087  JW00	1.6 1.6	,	te kinas nes: ade nylylsu o sapier 1999 #8	Cloning there of the contract of the contract of the contract of the contract of the contract of the contract of	as ader ATF> as sul: animal tifunci: i aden; i nucled in: sul:	Lmilarii Conse (QAHHVS)	/ltrans anum tul -1994 #; 57497; 6-112, cion and mber: 57497	iminary =: mRNA 124 <klo nces: El sulfato sulfato :: sulfi</klo 	imilari ; Cons
RESULT :  JW00087  JW0087  JW0087  AD1607  C, Social Street  C, Access  A, Access  A, Access  A, Access  A, Cross  A, Cross  C, Superi  C, Specie  C, Spec	, 10 10 10		L-sulfat nate nam ins: ade ss: Homc 310n: JW isawa, K Rioteck	construction in the construction of the construction of the construction is constructed in the construction in the construction in the construction is constructed in the construction in	iption: ion: <st 20="" 5="" domai<="" domair="" family:="" iption:="" mul="" rds:="" region:="" td=""><td>atch cal S 38 20 30</td><td>adenyl) adenyl) es: Sole 07-Sep. sion: S( s, D.; P 6, 109 : Isolat sion: Si</td><td>ule type ues: 1-4 referer ics: met3-1 family: rds: nuc</td><td>al</td></st>	atch cal S 38 20 30	adenyl) adenyl) es: Sole 07-Sep. sion: S( s, D.; P 6, 109 : Isolat sion: Si	ule type ues: 1-4 referer ics: met3-1 family: rds: nuc	al
·	30 31 32		RESULT 1 JW0087 adenylyl N,Alterr N,Contai C,Specif C,Date: C,Access R,Yanaqi	A) Title A) Refere A) Access A) Molecu A) Residu A) Cross A) Experi	A, Descri C, Funct: A, Descri C, Superi C, Keywol F, 52-21 F, 59-66, F, 226-62	Query Best Matcl	RESULT: S44079 Sulfate C; Specif C; Date: R; Klonu Plant J Plant J A; Title A; Refere	A, Status A, Molecu A, Residu A, Cross C, Gene: A, Gene: C, Superi C, Keywon F, 11-40	. Query Best   Match

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A. Molecule type: mRNA
A. Residues: 1-610 <ROS>
A. Cross-references: GB:L39001; NID:g705384; PIDN:AAB00139.1; PID:g705385
A. Cross-references: GB:L39001; NID:g705384; PIDN:AAB00139.1; PID:g705385
C. Genetics:
A. Description: as adenylylsulfate kinase catalyzes the phosphorylation of adenylylsulfate
C. Superfamily: animal 3'-phosphoadenosine-5'-phosphoaulfate synthetase; adenylylsulfate
C. Superfamily:
A. Description: as sulfate adenylylsulfate kinase homology <ask>ASK></a>
F. 37-200/Domain: adenylylsulfate kinase homology <ask>ASK></a>
F. 31-GODMOMAIN: 3'-phosphoadenosine-5'-phosphosulfate binding #status predicted <PA
F. 311-GOSMOMAIN: Sulfate adenylyltxansferase homology <ask>ASK></a>
A;Title: A multifunctional Urechis caupo protein, PAPS synthetase, has both ATP sulfu A;Reference number: JC4383; MUID:96096529; PMID:8522184
A;Accession: JC4383
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         senescence related genes by su
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T.M.; Terryn,
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A;ExperImental source: cv. Falcon; senescing leaves
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       probable sulfate adenylyltransferase (EC 2.7.7.4) - rape
C;Species: Barasica napus (rape)
C;Date: 11-Jun-1999 #sequence_revision 11-Jun-1999 #text_change 21-Jul-2000
C;Accession: T08594
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Plant Mol. Biol. 33, 821-834, 1997
A;Title: Leaf senescence in Brassica napus: cloning of s
A;Reference number: 216446; MUID:97260386; PMID:9106506
A;Accession: T08594
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Matches 22; Conserv
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                                                                                                                                              C.Species: Soldnum. C.Species: Soldnum. C.Species: Soldnum. C.Species: 08-Sep-1994 #sequence_revision. C7498, 44267
C.Accession: S67498, 44267
C.Accession: S67497; WulD:95004649; PMID:7920699
A.Title: Isolation and characterization of two cDNA clones encoding ATP-sulfurylases from the companies of the companies
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Gene: met3-2
C;Superfamily: sulfate adenylyltransferase met3-1; sulfate adenylyltransferase homology
C;Keywords: chloroplast; nucleotidyltransferase
F;50-448/Domain: sulfate adenylyltransferase homology <SAT>
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N;Alternate names: adenosine 5'-phosphosulfate kinase; PAPS
N;Contains: adenylylsulfate kinase (EC 2.7.1.25); sulfate adenylyltransferase (EC 2.7.7.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C;Species: Zea mays (malze)
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 23-Mar-2001
C;Accession: T01204
R;Bolchi, A.; Petrucco, S.; Foroni, C.; Tenca, G.L.; Ottonello, S.
submitted to the EMBL Data Library, July 1997
A;Description: Sulfate permease and ATP sulfurylase mRNA are coordinately modulated in A;Reference number: Z14260
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A; Status: preliminary; translated from GB/EMBL/DDBJ
A; Molecule type: mRNA
A; Residues: 1-489
A; Cross-references: EMBL: AF016305; NID: 92738749; PIDN: AAB94542.1; PID: 92738750
A; Experimental source: cultivar Paulo; root
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C;Date: 17-Jan-1996 #sequence_revision 19-Apr-1996 #text_change 03-Jun-2002
C;Accession: JC4383
R;Rosenthal, E.; Leustek, T.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Status: preliminary
A;Molecule type: mRNA
A;Residues: 1-463 <KLO>
A;Cross-references: EMBL:X79053; NID:g479089; PIDN:CAA55655.1; PID:g479090
C;Genetics:
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Pred. No. 5e-14;
                                                                                                                         sulfate adenylyltransferase (EC 2.7.7.4) met3-2 - potato
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100.0%; Pred. No. se ...
0; Mismatches
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Mismatches
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Best Local Similarity 100.9
Matches 22; Conservative
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Best Local Similarity
Matches 22; Conserv
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R;Murillo, M.; Leustek, T. Arch. Blochem. Blophys. 323, 195-204, 1995
Arch. Blochem. Blophys. 323, 195-204, 1995
A;Title: Adenosine-5'-triphosphate-sulfurylase from Arabidopsis thaliana and Escherizine-5'-triphosphate-sulfurylase cDNAs from Arabidopsis thaliana and analysis of a recall Reference number: S68024; MUID:96019964; PMID:7487067
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                                                                                                                       met3-1 precursor - Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C;Superfamily: sulfate adenylyltransferase met3-1; sulfate adenylyltransferase C;Keywords: chloroplast; nucleotidyltransferase F;1-62/Domain: transit peptide (chloroplast) #status predicted <TNP> F;62-476/Product: sulfate adenylyltransferase met3-1 #status predicted <MAT> F;64-462/Domain: sulfate adenylyltransferase homology <SAT>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: EMBL:U06276; NID:g1228103; PIDN:AAA92351.1; PID:g1228104
A;Experimental source: clone APS2
C;Genetics:
                                                                                                                                               N.Alternate names: ATP sulfurylase; sulfate adenjyltransferase APS2 C; Species: Arabidopsis thaliana (mouse-ear cress)
C; Date: 06-0ct-1994 #sequence_revision 10-Nov-1995 #text_change 16-Jul-1999 B; Klonus, D. S4943; S68024; S68202
R; Klonus, D. Submitted to the EMBL Data Library, May 1994
A; Description: ATP-sulfurylase cDNA clone from A.thaliana.
A; Reference number: S44943
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Molecule type: mRNA
A;Residues: 1-476 <KLO>
A;Cross_references: EMBL:X79210; NID:g487403; PIDN:CAA55799.1; PID:g487404
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Pred. No. 5.6e-13;
0; Mismatches 0; Indels
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A;Molecule type: DNA
A;Residues: 1-483 <HAT>
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Pred. No. 5.6e-1
0; Mismatches
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S44943
sulfate adenylyltransferase (EC 2.7.7.4)
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Matches 21; Conserv
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C.) Species: A. Companie: C. Companie: A. Companie: A. Companie: A. Companie: C. Companie: A. Companie: C. Comp
                                                                                                       erhoft, A.; Moores, T.; Jones, J.D.G.; Eneva, T.; Palme, K.; Benes, V.; Rechman, S.; Anstatis, N.
A.; Title: Analysis of 1.9 Mb of contiguous sequence from chromosome 4 of Arabidopsis thal A. Accession: E71409
A. Accession: E71409
A. Accession: E71409
A. Accession: E71409
A. Residues preliminary; nucleic acid sequence not shown; translation not shown
A. Molecule type: DNA
A. Residues: 1-465 < GBV.>
A.; Cross-references: GB: 297336; NID: 92244788; FIDN: CAB10247.1; PID: 92244824
A. Rochem: Blochem: Blochem: Alpophys: 323, 195-204, 1995
A. Title: Adenosine-5'-triphosphate-sulfurylase from Arabidopsis thaliana and Escherichia ine-5'-triphosphate-sulfurylase from Arabidopsis thaliana and analysis of a recomf A. Reference number: S68024; MUID: 96019964; PMID: 7487067
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A;Accession: S68201
A;Accession: SmB: U06275; NID: 9459143; PIDN: AAA92350.1; PID: 9459144
A;Cross-references: EMB: U06275; NID: 9459143; PIDN: AAA92350.1; PID: 9459144
C;Genetics: A;Amp position: 4COP9-4G3845
A;Genome: nuclear
C;Superfamily: sulfate ademylyltransferase met3-1; sulfate ademylyltransferase homology
C;Keywords: chloroplast; nucleotidyltransferase #status predicted <TNP>
F;1-50/Domain: transit peptide (chloroplast) #status predicted <TNP>
F;51-465/Porduct: sulfate ademylyltransferase homology <SAT>
F;52-450/Domain: sulfate ademylyltransferase homology <SAT>
1, T.; Hempel, S.; Kotter, P.; Entian, K.D.; Rieger, M.; Schaeffer, M.; Funk, B. 391, 485-488, 1998
                                                                           A; Authors: Mueller-Auer, S.; Silvey, M.; James, R.; Montfort, A.; Pons, A.; Puigo erhoft, A.; Moores, T.; Jones, J.D.G.; Eneva, T.; Palme, K.; Benes, V.; Rechman,
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Pred. No. 5.5e-13;
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A)Cross-references: EMBL:X75782; NID:g414736; PIDN:CAA53426.1; PID:g414737
A;Note: it is uncertain whether Met-1, Met-14 or Met-26 is the initiator
R;Rounsley, S.D.; Kaul, S.; Lin, X.; Ketchum, K.A.; Crosby, M.L.; Brandon, R.C.; Syke submitted to the EMBL Data Library, June 1998
A;Description: Arabidopsis thaliana chromosome II BAC F26C24 genomic sequence.
A;Reference number: 214680
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R; Lin, X.; Kaul, S.; Rounsley, S.D.; Shea, T.P.; Benito, M.I.; Town, C.D.; Fujii, C.Y
M.; Koo, H.; Woffat, K.S.; Cronin, L.A.; Shen, M.; Vanaken, S.E.; Umayam, L.; Tallon,
euss, D.; Nierman, W.C.; White, O.; Eisen, J.A.; Salzberg, S.L.; Fraser, C.M.; Venter
Nature 402, 761-768, 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Cross-references: EMBL:AL158056; PIDN:CAB76273.1; GSPDB:GN00066; SPDB:SPAC1782.11
A;Experimental source: strain 972h(-); cosmid c1782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Title: Sequence and analysis of chromosome 2 of the plant Arabidopsis thaliana. A;Reference number: A84420; MUID:20083487; PMID:10617197 A;Accession: A84521
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N;Alternate names: APS kinase; protein F26C24.11
C;Species: Arabidopsis thaliana (mouse-ear cress)
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 03-Jun-2002
C;Accession: S47640; T02601; A84521; S38587
R;Arz, H.E.; Gisselmann, G.; Schiffmann, S.; Schwenn, J.D.
Biochim. Biophys. Acta 1218, 447-452, 1994
A;Title: A cDNA for adenylyl sulphate (APS)-kinase from Arabidopsis thaliana. A;Reference number: S47640; MUID:94325358; PMID:8049272
                                                                                                                                                                                                                                                                                                                                                                · fission yeast (Schizosaccharomyces pombe)
                                                                                                                                                                                                                                                                                                                                                                                               C;Species: Schizosaccharomyces pombe
C;Date: 09-Jun-2000 #sequence_revision 09-Jun-2000 #text_change 21-Jul-2000
C;Accession: T50101
R;Wood, V.; Rajandream, M.A.; Barrell, B.G.; Brown, S.; Harris, D.
A;Reference number: 225037
                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Map position: 1
A;Introns: 157/1
C;Superfamily: adenylylsulfate kinase; adenylylsulfate kinase homology
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No. 4e-05;
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Pred. No. 4.5e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: preliminary; translated from GB/EMBL/DDBJ
                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
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                            Pred.
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A;Molecule type: DNA
A;Residues: 1-276 <ROU>
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Best Local Similarity 100.0%; P
Matches 13; Conservative 0;
                        100.0%;
                                                                                                                                                                                                                                                                                                                                                                adenylylsulfate kinase [imported]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 161 KGLYKRARAGEIK 173
                                                                                                                              28
                                                                                                                                                                                          WLTGLSGAGKTTI 21
                                                           Conservative
                                                                                                                           46 WLTGLSGAGKTTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Gene: SPDB: SPAC1782.11
                        Best Local Similarity
Matches 13; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: mRNA
A; Residues: 1-276 <ARZ>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Status: preliminary A;Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Molecule type: DNA
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C.Function: 
C.Function: 
C.Function: as sulfate adenylyltransferase catalyzes the reaction of sulfate and ATP
C.Superfamily: animal 3'-phosphoadenosine-5'-phosphosulfate synthetase; adenylylsulfate
C.Superfamily: animal 3'-phosphoadenosine-5'-phosphosulfate synthetase; P-loop;
F.56-219/Domain: adenylylsulfate kinase homology <a href="https://documentologide-binding">
F.56-219/Domain: adenylylsulfate kinase homology <a href="https://documentologide-binding">
F.63-70/Region: nucleotide-binding motif A (P-loop)
F.180-190/Domain: 3'-phosphoadenosine-5'-phosphosulfate binding #status predicted <PAB>
F.230-647/Domain: sulfate adenylyltransferase homology <AIP>
F.230-647/Domain: sulfate adenylyltransferase homology <AIP</a>

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E.R.Accession: 574917

R.Kaneko, T.; Sato, S.; Kotani, H.; Tanaka, A.; Asamizu, E.; Nakamura, Y.; Miyajima, N.; O, K.; Okumura, S.; Shimpo, S.; Takeuchi, C.; Wada, T.; Watanabe, A.; Yamada, M.; Yasuda DNA Res. 3, 109-136, 1996

A.Title: Sequence analysis of the genome of the unicellular cyanobacterium Synechocystis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Description: as adenylylsulfate kinase catalyzes the phosphorylation of adenylylsulfat
C;Function: <SATF>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Cross-references: EMBL:D90902; GB:AB001339; NID:q1652027; PIDN:BAA16957.1; PID:g165203
A;Note: the nucleotide sequence was submitted to the EMBL Data Library, June 1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Experimental source: clone T14G10.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Variety: PCC 6803
C; Date: 10-Sep:1999 #sequence_revision 10-Sep-1999 #text_change 03-Jun-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     adenylyl-sulfate kinase (EC 2.7.1.25) · Synechocystis sp. (strain PCC 6803) N;Alternate names: protein slr0676 C;Species: Synechocystis sp.
                                                                                                                                                                                                                                                                                                                     22-Oct-1999 #sequence_revision 22-Oct-1999 #text_change 19-Jan-2001
                                                                                                                                                                                                                          phosphoadenosine-5'-phosphosulfate synthetase - Caenorhabditis elegans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      F;137/Binding site: phosphate (Ser) (covalent) #status predicted
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A; Accession: S74917
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9.3e-10;
hes 0;
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                                                                                                                                                                                                                                                                                                                                                                                                                    submitted to the EMBL Data Library, January 1996
A;Reference number: 219954
A;Accession: T24918
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                     LLLHPLGGWTKDDDVPLD 456
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C; Species: Caenorhabditis elegans
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Residues: 1-652 <WIL>
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δλ g

A; Residues: 1-276 <STO>

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adenyly1-sulfate kinase (EC 2.7.1.25) [validated] - Arabidopsis thaliana (S.Speciess Arabidopsis thaliane (mouse-ear cress) (S.Speciess: Arabidopsis thaliane (mouse-ear cress) (C.Speciess: 14-May-1999 #text_change 03-Jun-2002 (S.Accession: T06100; T52055 (S.Sevan, M.; Murphy, G.; Ridley, P.; Hudson, S.; Bancroft, I.; Mewes, H.W.; Mayer, K.F.Xsubmitted to the Protein Sequence Database, March 1999
A;Cross-references: GB:AE002093; NID:g3252812; PIDN:AAC24182.1; GSPDB:GN00139 C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A,Cross-references: EMBL:AL035708
A;Experimental Source: cultivar Columbia; BAC clone T5J17
R;Arz, H.E.; Gisselmann, G; Schlffmann, S.; Schwenn, J.D.
Biochim. Biophys. Acta 1218, 447-452, 1994
A;TitLe: A cDNA for adenylyl sulphate (APS)-kinase from Arabidopsis thaliana.
A;Reference number: S47640; MUID:94325358; PMID:8049272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                              A.Genome: nuclear
A.Genome: nuclear
A.Introns: 66/1; 113/1; 163/1; 202/3; 231/1; 246/3
C.Superfamily: adenylylsulfate kinase; adenylylsulfate kinase homology
C.Keywords: ATP; P-loop; phosphotransferase; purine nucleotide binding
F.1-37/Domain: transit peptide (chloroplast) #status predicted <INP>
F.38-276/Product: adenylylsulfate kinase #status predicted <MAT>
F.101-262/Domain: adenylylsulfate kinase homology <ASK>
F.108-115/Region: nucleotide-binding motif A (P-loop)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Description: EC 2.7.1.25 [validated, MUID:94325358]
C; Superfamily: adenylylsulfate kinase; adenylylsulfate kinase homology
C; Keywords: ATP; P-loop; phosphotransferase; purine nucleotide binding
F;115-279/Domain: adenylylsulfate kinase homology <ASK>
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0.00065;
hes 0; Indels
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A;Molecule type: mRNA
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C;Genetics:
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A;Introns: 78/1; 177/1; 216/3; 245/1; 260/3
A:Note: T5J7.110
C;Function:
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Best Local Similarity luv...
Thos 12; Conservative
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                                                            A; Gene: At2g14750; F26C24.11
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A; Molecule type: DNA
A; Residues: 1-293 <BEV>
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Matches 12
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Gaps

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0; Indels

Search completed: May 30, 2003, 12:33:08 Job time : 44 secs

76 LDGDNVRHGLNR 87

ò q THIS PAGE BLAMK (USPIN)

# GenCore version 5.1.6 (c) 1993 - 2003 Compugen Ltd. Copyright

protein search, using sw model protein

Run on:

(without alignments) May 30, 2003, 12:21:10 ; Search time 24 Seconds

updates/sec

US-09-898-165B-7

score: Perfect

1 MSGIKKOKTENQOKSTNVVY......MAPKAWKVLTDYYRSEMDKN 615 Sequence:

OLIGO Gapop 60.0 , Gapext 60.0 Scoring table:

112892 segs, 41476328 residues Searched:

10 Word size : of hits satisfying chosen parameters: Total number

21

length: 0 length: 2000000000 sed 0B Minimum Maximum

Post-processing: Listing first 1000 summaries

SwissProt\_40:\* Database : Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

Description	095340 h bifunctio	≣ ບ	043252 h bifunctio	E		Q12657 penicillium	P72940 synechocyst	Q43295 arabidopsis	049196 arabidopsis	x cysn/	ч	007309 r nodg bifu	P13442 r nodg bifu	P72339 r nodg bifu	P43520 thermus the	P57702 pseudomonas	P29811 pseudomonas	049204 catharanthu	P23846 escherichia	. Q9kp21 vibrio chol
ΙĐ	PPS2_HUMAN	PPS1_CAVPO	PPS1_HUMAN	PPS1_MOUSE	KAPS_EMENI	KAPS_PENCH	CYSC_SYNY3	KAP1_ARATH	KAP2_ARATH	CYSN_XYLFA	NODQ_RHITR	NODQ_RHISB	NODQ_RHIME	NODO_RHIS3	YEMT_THETH	CYC1_PSEAE	CYC2_PSEAE	KAPS_CATRO	CYSC_ECOLI	CYSC_VIBCH
DB	-		Н	Н	Н	-	-	-	Н	Н	Н	Н	-	Н	Н	<del>, - 1</del>		Н	Н	٦
% Query Match Length DB	614	624	624	624	206	211	177	276	293	623	632	633	641	646	110	196	214	312	200	215
% Query Match	82.8	6.2	6.2	6.2	2.4	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.8	1.8	1.8	1.8	1.6	1.6
Score	509	38	38	38	15	15	13	12	12	. 12	12	12	12	12	11	11	11	11	10	10
Result No.	1	4 m	4	5	9	7	80	6	10	11	. 12	, 13	14	. 15	16	17	18	19	50	21

### ALIGNMENTS

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PPZZ_HUWAN STANDARD; PRI; 614 AA. 095340: 091830: 098ZL2; 09P0G6; 09UHM1; 09UKD3; 30-MAY-2000 (Rel. 39, Created) 15-JUN-2002 (Rel. 41, Last annotation update) 15-JUN-2002 (Rel. 41, Last annotation update)
                 PPS2_HUMAN
RESULT 1
                                     H H H H H
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Strausberg R.;
Submitted (JUL-2001) to the EMBL/GenBank/DDBJ databases.
Submitted (JUL-2001) to the EMBL/GenBank/DDBJ databases.

C. -!- FUNCTION: BIFUNCTIONAL ENZYME WITH BOTH ATP SULFURIESE AND APS
KINASE ACTIVITY, WHICH MEDIATES TWO STEEP IN THE SULFATE
CROUP TO ATP TO YIELD ADBNOSINE 5'- PHOSPHOSULFATE (APS), AND THE
SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO APS
YIELDING 3'- PHOSPHOADENILYLSULFATE (PAPS: ACTIVATED SULFATE DONOR
USED BY SULFOTRANSFERASE). IN MAMMALS, PAPS IS THE SOLE SOURCE OF
SULFATE. APS APPEARS TO BE ONLY AN INTERMEDIATE IN THE SULFATE.

CATIVATION PATHWAY. MAY HAVE A IMPORTANT ROLE IN SKELETGGENESIS
DURING POSTNATAL GROWTH (BY SIMILARITY).

C. -!- CATALYTIC ACTIVITY: ATP + sulfate = ADPh + 3'-Bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthethase 2 (PAPS synthethase 2) (FAPS 2) (Sulfurylase kinase 2) (SK2) (SK2) [Includes: Sulfate adenylyltransferase (FC 2.7.1.4) (Sulfate adenylyltransferase) (SAT) (ATP-sulfurylase); Adenylylsulfate adenylate (FC 2.7.1.25) (Adenylylsulfate 3'-phosphotransferase) (APS kinase) (Adenosine-5'-phosphosulfate 3'-phosphotransferase) (3'-phosphosulfate synthetase)]. "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) and PAPSS2: gene cloning, characterization and chromosomal localization."; Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE=Fetal cartilage; MEDLINE=98442651; PubMed=9771708; Ul Haque M.F., King L.M., Krakow D., Cantor R.M., Rusiniak M.E., Swank R.T., Superti-Furga A., Haque S., Abbas H., Ahmad W., Ahmad M., ы Ш the ATP SEQUENCE FROM N.A. (ISOFORM A).
Fuda H., Shimizu C., Strott C.A.;
"Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase:
differential expression of isoforms and effect of polymorphisms on Homo saplens (Human). Fukarvota; Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi; Wood T.C., SEQUENCE FROM N.A. (ISOFORM A). Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt Sutherland G.R.; Cohn D.H.; "Mutations in orthologous genes in human spondyloepimetaphyseal SEQUENCE FROM N.A. (ISOFORM B).
Venkatachalam K.V., Fuda H., Strott C.A.;
13. -phosphoadenosine 5'-phosphosulfate synthase 2b isoform.";
Submitted (JAN-2001) to the EMBL/GenBank/DDBJ databases. "Genomic organization of the mouse and human genes encoding sulfurylase/adenosine 5'-phosphosulfate kinase isoform SK2." J. Biol. Chem. 274:33306-33312(1999). SEQUENCE FROM N.A. (ISOFORM A).
MEDLINE=20145412; PubMed=10679223;
M.Z.-H., Otterness D.M., Freimuth R.R., Carlini E.J., Woock
Mitchell S., Moon E., Kim U.-J., Xu J.-P., Siciliano M.J.,
Weinshilboum R.M.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases dysplasia and the brachymorphic mouse."; Nat. Genet. 20:157-162(1998). Kurima K., Singh B., Schwartz N.B.; MEDLINE=20026854; PubMed-10559207; SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM B). SEQUENCE FROM N.A. (ISOFORM A). Eukaryota; Metazoa; Chordata; Mammalia; Eutheria; Primates; NCBI\_TaxID=9606; PAPSS2 OR ATPSK2 TISSUE-Colon; TISSUE-Liver; DDDEBE

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FISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDS 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              dysplasia and the brachymorphic mouse.";
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                                                                                                                                                                                                                                                                                                                                                                              Mus musculus (Mouse).
                                                                                                                                                                                                                                                                                                                                                                 WKVLTDYYRS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PAPSS2 OR ATPSK2
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 121
                       121
                                              181
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                                                                                                                                                                                                                        entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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                                                     produced by alternative splicing.

1- TISSUE SPECIFICITY: EXPRESSED IN CARTILAGE.

1- DISBASE: DEFECTS IN PAPSZ ARE THE CASE OF SPONDYLOEPIMETAPHYSEAL.

DYSPLASIA, PAKISTANI TYPE (SEMD), AN AUTOSOMAL RECESSIVE DISBASE.

THIS FORM OF SEMD IS CHARACTERIZED BY A DYSPLASIA THAT IS SPRANTILY EPIPHYSEAL WILLD METAPHYSEAL ABNORMALITIES.

PRIMARILY EPIPHYSEAL WITH ONLY WILLD METAPHYSEAL ABNORMALITIES.

1- SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE APS KINASE
          PATHWAY: BELONGS TO THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF CYSTEINE AND METHIONINE, AND TO THE SULFATION OF PROTEINS, CARBOHYDRATES, LIPIDS, SHUGS AND XENOBIOTICS.
ALTERNATIVE PRODUCTS: 2 isoforms; a (shown here) and b; are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 MSGIKKOKTENQQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FORMS THE PHOSPHOSERINE INTERMEDIATE (BY SIMILARITY).

PP-MOTIF (BY SIMILARITY).
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Transferase; Nucleotidyltransferase; Kinase; Multifunctional enzyme;
                                                                                                                                                SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE SULFATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     D -> DGMALP (IN ISOFORM B).
R -> K (IN REF. 2).
E -> G (IN REF. 1).
R -> C (IN REF. 1).
P -> L (IN REF. 1).
7. S2F4B6D972DDA91E CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SULFATE ADENYLYLTRANSFERASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        family; Alternative splicing.
ADENYLYLSULFATE KINASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
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.larity 99.8%; Pred. No. 0
Conservative 0; Mismatch
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InterPro; IPR002650; ATP-sulfurylase.
Pfam; PF01383; APS_Kinase; 1.
ProDom; PF01747; ATP-sulfurylase; 1.
ProDom; PD002350; APS_Kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                          JOINED.
JOINED.
JOINED.
                                                                                                                                                             ADENYLYLTRANSFERASE FAMILY.
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AAH09894.1;
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AAF40307.2;
 phosphoadenylylsulfate.
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614 AA;
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609; Conserv
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ACT_SITE
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SEQUENCE
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Best Local 9
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088428: 092274;
09.000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation sequence of PAPS
16-OCT-2001 (Rel. 40, Last annotation update)
16-OCT-2001 (Rel. 40, Last ann
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241 AETLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLDDGVINMSIPIVL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TISSUE-Liver;
MEDLINE=98337975; PubMed=9671738;
Kurima K., Warman M.L., Krishnan S., Domowicz M., Krueger R.C. Jr.,
Devrup A., Schwartz N.B.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A., VARIANT BM ARG-79, AND VARIANT LYS-109.
STRAIN=PWK; TISSUE=Spleen;
MEDLINE=98442651; PubMed=9771708;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Natl. Acad. Sci. U.S.A. 95:8681-8685(1998).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             phosphoadenylyisulfate.

PHOSPHOATE BELONGS TO THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BLOSYWTHESIS OF CYSTEINE AND METHIONINE, AND TO THE SULFATION OF PROTEINS, CARBOHYDRATES, LIPIDS, DRUGS AND XENOBIOTICS.

TISSUE SPECIFICITY: EXPRESSED IN LIVER, CARTLIAGE, SKIN AND BRAIN. DISEASE: DEFECTS IN PAPSS2 ARE THE CAUGS OF BRACHYMORPHISM (BM), A AUTOSOMAL RECESSIVE DISEASE, WHICH IS CHARACTERIZED BY ABNORMAL
            KINASE ACTIVITY. WHICH MEDIAPES YMO STPES IN THE SULFURYLASE AND APS KINASE ACTIVITY. WHICH MEDIAPES YMO STPES IN THE SULFATE ACTIVATION PATHWAY. THE FIRST STEP IS THE TRANSFER OF A SULFATE GROUP TO ATP TO YIELD ADENOSINE 5'-PHOSPHOSULFATE (APS), AND THE SECOND STPE IS THE TRANSFER OF A PHOSPHATE GROUP FROM APP TO APS YIELDING 3'-PHOSPHOADENTLYLSULFATE (PARS: ACTIVATED SULFATE DONOR USED BY SULFOTRANSFERASE). IN MAMMALS, PAPS IS THE SOLE SOURCE OF SULFATE. AS APPEARS TO BE OMLY AN INTERNEDIATE IN THE SULFATE ACTIVATION PATHWAY. MAY HAVE A IMPORTANT ROLE IN SKELETOGENESIS DURING POSTNATAL GROWTH.
                                                                                                                                                                                                                                                                                                                                                                                 HEPATIC DETOXIFICATION, BLEEDING TIMES AND POSTNATAL GROWTH, SUCH AS DOME-STRAED SKULL, SHORT THICK TAIL, AND SHORTENED BUT NOT WIDENED LIMES. THE ABNORMAL POSTNATAL GROWTH HAS BEEN ATTRIBUTED TO UNDERSULPATION OF CARTILAGE PROTEOGLYCANS.
                                                                                                                                                                                                      CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate.
CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATP (POTENTIAL).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Transferase; Nucleotidyltransferase; Kinase; Multifunctional enzyme; ATP-binding; Multigene family; Disease mutation; Polymorphism.

1 ?211 ADENYLYLSULFATE KINASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE SULFATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PP-MOTIF (BY SIMILARITY).
G -> R (IN BM; ACTIVITY ABOLISHED).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13.2%; Score 81; DB 1; Length 621;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SULFATE ADENYLYLTRANSFERASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S -> F (IN REF. 2).
MISSING (IN REF. 2).
DE375F06A79EFAAB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5.4e-75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          InterPro; IPR002650; ATP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ProDom, PD002350; APS_kinase, 1.
ProDom, PD002381; ATP-sulfurylase, 1.
TIGRPAMs, TIGR00455; apsK; 1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MGD; MGI:1330223; Papss2.
InterPro; IPR002891; APS_kinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADENYLYLTRANSFERASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; AF052453; AAC40191.1; -. EMBL; AF085144; AAC98687.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       70290 MW;
Genet. 20:157-162(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                100.08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  81; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        521
79
109
5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     621 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
NP_BIND
ACT_SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VARIANT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SITE
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local
Matches
g
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                                                                                                          30-MAY-2000 (Rel. 39, Created)
31 30-MAY-2000 (Rel. 39, Created)
31 30-MAY-2000 (Rel. 39, Last sequence update)
31 40-MAY-2000 (Rel. 40, Last sequence update)
32 40-MAY-2001 (Rel. 40, Last annotation update)
33 50-MAY-2001 (Rel. 40, Last annotation update)
34 6-MAY-2001 (Rel. 40, Last annotation update)
35 50-MAY-2001 (Rel. 40, Rel. 40, Rel. 41)
36 50-MAY-2001 (Rel. 40, Rel. 41)
37 50-MAY-2001 (Rel. 40, Rel. 41)
38 50-MAY-2001 (Rel. 41)
38 50-MAY-2001 (Rel. 41)
39 50-MAY-2001 (Rel. 41)
39 50-MAY-2001 (Rel. 41)
39 50-MAY-2001 (Rel. 40, Rel. 41)
30 50-MAY-2001 (Rel. 40, Rel. 41)
30 50-MAY-2001 (Rel. 41)
31 50-MAY-2001 (Rel. 41)
32 50-MAY-2001 (Rel. 41)
33 50-MAY-2001 (Rel. 41)
36 50-MAY-2001 (Rel. 41)
37 50-MAY-2001 (Rel. 41)
38 50-MAY-2001 (Rel. 41)
39 50-MAY-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FUNCTION BIPOTOTION BUTTON WITH BOTH ATP SULENTLASE AND APS
KINASE ACTIVITY, WHICH MEDIATES TWO STEPS IN THE SULFATE
ACTIVATION PATHWAY. THE FIRST STEP IS THE TRANSFER OF A SULFATE
GROUP TO ATP TO YIELD DENOSINE 5 - PHOSPHOSULEATE (APS), AND THE
SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO APS
YIELDING 3 '-PHOSPHOADENTIALSULFATE (PAPS); AND THE
SULFATE, APS APPEARS TO BE ONLY AN INTERNEDIATE IN THE SULFATE DONOR
USED BY SULFOTRANSFERASE). IN MAMMALS, PAPS IS THE SOLE SOURCE OF
SULFATE, APS APPEARS TO BE ONLY AN INTERNEDIATE IN THE SULFATE.
L-SELECTIN LIGANDS IN ENDOTHELIAL CELLS (BY SIMILARITY).

L-SELECTIN LIGANDS IN ENDOTHELIAL CELLS (BY SIMILARITY).

-: CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adentylylsulfate.
-: CATALYTIC ACTIVITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATP (POTENTIAL). FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Probom; PD002350; APS_kinase; 1.
Probom; PD002381; ATP-sulfurylase; 1.
TIGREAMs; TIGR00455; apsK; 1.
Transferase; Nucleotidyltransferase; Kinase; Multifunctional enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -! - SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE SULFATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SULFATE ADENYLYLTRANSFERASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
STRAIN-NIH 2;
Venkatachalam K.V., Akita H., Strott C.A.;
Submitted (MAY-1997) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BF7461B4D07F2131 CRC64;
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                                                           624 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro; IPR002891; APS_kinase.
InterPro; IPR002650; ATP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Transferase; Nucleotidyltransf
ATP-binding; Multigene family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             70395 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL,; AF004875; AAC02266.1;
                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             624 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=10141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          133
                                                           PPS1_CAVPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ACT_SITE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DOMAIN
RESULT 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SITE
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DB 1; Length 624;

Score 38;

6.28;

Query Match

CATALYTIC ACTIVITY: ATP + adenylylsulfate - ADP + 3'-

phosphoadenylylsulfate. ENZYME REGULATION: INHIBITED BY CHLORATE.

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ö
                                                                                                                                                              043252; 043841; 075332;
30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
30-MAY-2000 (Rel. 31, Last sequence update)
15-JUN-2002 (Rel. 41, Last amotation update)
Bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthethase 1 (PAPS synthethase 1) (PAPS 1) (Sulfurylase kinase 1) (SKI) (SKI)
Includes: Sulfate adenylyltransferase (EC 2.7.7.4) (Sulfate adenylate: transferase) (SAP) (APP-sulfate) (APP-sulfate 3'-phosphotransferase) (APS kinase)
(Adenosine-5'-phosphosulfate 3'-phosphotransferase) (3'-phosphoadenosine-5'-phosphosulfate synthetase)].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO APS YIELDING 3'-PHOSPHOADENYLYLSULFATE (PAPS: ACTIVATED SULFATE DONOR USED BY SULFOTRANSFERASE). IN MAMMALS, PAPS IS THE SOLE SOURCE OF SULFATE; APS APPEARS TO BE ONLY AN INTERMEDIATE IN THE SULFATE. ACTIVATION PATHWAY. ALSO INVOLVED IN THE BIOSYNTHESIS OF SULFATED L-SELECTIN LIGANDS IN ENDOTHELIAL CELLS.

CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TISSUE-Fetal brain;
MEDLINE-98334672; PubMed-9668121;
Wenkatachalam K.V., Akita H., Strott C.A.;
"Molecular cloning, expression, and characterization of human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase and its
                                                                                                                                                                                                                                                                                                                                                                Eukaryota, Metazoa, Chordata; Craniata; Vertebrata, Buteleostomi;
Mammalia, Eutheria, Primates, Catarrhini, Hominidae, Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Girard J.-P., Baekkevold E.S., Amalric F.;
"Sulfation in high endothelialvenules: cloning and expression of
human PAPS synthetase.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Yanagisawa K., Sakakibara Y., Suiko M., Takami Y., Nakayama T., Nakayanagi K., Natori Y., Liu M.-C.; "chak cloning, expression, and characterization of the human bifunctional ATP sulfurylase/adenosine S.-phosphosulfate kinase
               ö
              Indels
                                                                         67
                                            YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 57
              ;
                                                             Biosci. Biotechnol. Biochem. 62:1037-1040(1998).
 Pred. No. 1e-30;
                                                                                                                                                     624 AA
              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        J. Biol. Chem. 273:19311-19320(1998)
                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE-98236023; PubMed-9576487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE-98312048; PubMed-9648242;
              ;
0
100.08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ASEB J. 12:603-612(1998).
              Conservative
                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                  Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           domains."
 Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=9606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      rissue-Brain;
                                                                                                                                                   PPS1_HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         functional
                                            20
                                                                                                                        ULT 4
1_HUMAN
              Matches
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30-MAY-2000 (Rel. 39, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
16-0CT-2001 (Rel. 40, Last annotation update)
16-0CT-2001 (Rel. 40, Last annotation update)
16-0CT-2001 (PAPS SULP)
16-0CT-2001 (PAPS SULP)
17-0CT-2001 (SAI) (SAI) (SAI)
17-0CT-2001 (SAI) (ATP-sulfurylase); Adenylylsulfate adenylate transferase) (SAI) (ATP-sulfurylase); Adenylylsulfate kinase
                                                                            OF PROTEINS, CARBOHYDRATES, LIPIDS, DRUGS AND XENOBIOTICS.
TISSUE SPECIFICITY: EXPRESSED IN TESTIS, PANCREAS, KIDNEY, THYMUS, PROSTATE, OVARY, SMALL INTESTINE, COLON, LEUKOCYTES AND LIVER. ALSO EXPRESSED IN HIGH ENDOTHELIAL VENULES (HEV) CELLS AND IN
                                              PATHWAY: BELONGS TO THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF CYSTEINE AND METHIONINE, AND TO THE SULFATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AIR (FUTENTIAL). FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Probom; PD002350; APS_Kinase; 1.
Probom; PD002381; ATP-sulfurylase; 1.
TIGRPAMS; TIGR00455; apsK: 1.
Transferase; Nucleotidyltransferase; Kinase; Multifunctional enzyme; ATP-binding; Multigene family.
                                                                                                                                                            SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                           C-TERMINAL SECTION; BELONGS TO THE SULFATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SIMILARITY).
PP-MOTIF (BY SIMILARITY).
H->A: LOSS OF ACTIVITY.
N->K: INCREASED ACTIVITY.
G->A: 30% DECREASE IN ACTIVITY.
H->A: LOSS OF ACTIVITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 624;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADENYLYLSULFATE KINASE.
SULFATE ADENYLYLTRANSFERASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GH->AA: LOSS OF ACTIVITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S -> L (IN REF. 2).
6BC4F9648016CA31 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30 YQAHHVSRNKRGQVVGTRGFFRGCTVWLTGLSGAGKTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 L -> F (IN REF. 2)
MISSING (IN REF. 2
S -> L (IN REF. 2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 38; DB 1;
Pred. No. 1e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATP (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     624 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            100.0%; Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Interpro; IPR002891; APS_kinase.
Interpro; IPR002650; APP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                             SIMILARITY: IN THE C-TERMIN ADENYLYLTRANSFERASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                          EMBL; U53447; AAC39894.1; -.
EMBL; AF033026; AAC28429.1; -.
Genew; HGNC:8603; PAPSS1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  587 S
70847 MW;
                                                                                                                                                                                                                                                                                                                                                                           EMBL; Y10387; CAA71413.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    38; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    624
66
133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 270
456
587
624 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       59
133
                                                                                                                                                                                                                                                                                                                                                                                                                                          MIM; 603262;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PPS1_MOUSE
Q60967;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
NP_BIND
ACT_SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
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MUTAGEN
MUTAGEN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MUTAGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SITE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
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30 YOAHHVSRNKRGOVVGTRGGFRGCTVWLTGLSGAGKTT 67

KAPS\_EMENI

RESULT

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There are no restrictions on its 19 as its content is in no way.
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or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on it
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   phosphoadenylylsulfate.
PATHWAY: BELONGS TO THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF CYSTEINE AND METHIONINE, AND TO THE SULFATION
                                                                                                                                                                                                                                                                                                                                                FUNCTION: BIFUNCTIONE. ENZYME WITH BOTH ATP SULFURYLASE AND APS KINASE ACTIVITY, WHICH MEDIATES TWO STEPS IN THE SULFATE CATIVATION PATHWAY. THE FIRST STEP IS THE TRANSFER OF A SULFATE GROUP TO ATP TO YIELD ADENOSINE 5'-PHOSPHOSULFATE (APS), AND THE SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO APS YIELDING 3'-PHOSPHOADENYLXLSULFATE (PAPS: ACTIVATED SULFATE DONOR USED BY SULFOTRANSFERASE). IN MAMMALS, PAPS IS THE SOLE SOURCE OF SULFATE; APS APPEARS TO BE ONLY AN INTERMEDIATE IN THE SULFATE. ACTIVATION PATHWAY. ALSO INVOLVED IN THE BIOSYNTHESIS OF SULFATE. ILSELECTIN LIGANDS IN ENDOTHELIAL CELLS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate.
CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TIGRFAMs; TIGRO0455; apsK; 1.
Transferase; Nucleotidyltransferase; Kinase; Multifunctional enzyme;
ATP-binding; Multigene family.
                                                                                                                                                                                                                     MEDLINE-96094345; PubMed=7493984;
Li H., Deyrup A., Mensch J.R. Jr., Domowicz M., Konstantinidis A.K.
Schwartz N.B.;
                                                                                                                                                                                                                                                                                        "The isolation and characterization of cDNA encoding the mouse
bifunctional ATP sulfurylase-adenosine 5'-phosphosulfate kinase.";
J. Biol. Chem. 270:29453-29459(1995).
(EC 2.7.1.25) (Adenylylsulfate 3'-phosphotransferase) (APS kinase) (Adenosine-5'-phosphosulfate 3'-phosphotransferase) (3'-phosphoadenosine-5'-phosphosulfate synthetase)].
PAPSSI OR PAPSS OR ASPAK OR ATPSKI.
                                                                                                     Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE SULFATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OF PROTEINS, CARBOHYDRATES, LIPIDS, DRUGS AND XENOBIOTICS. TISSUE SPECIFICITY: EXPRESSED IN THE NEONATAL BRAIN AND IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 38; DB 1; Length 624;
Pred. No. 1e-30;
); Mismatches 0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SULFATE ADENYLYLTRANSFERASE.
ATP (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B487EFAF9B78BE3E CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADENYLYLSULFATE KINASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              use by non-profit institutions as long a modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MGD; MGI:1330587; Papss:.
InterPro; IPR002891; APS_kinase.
InterPro; IPR002650; ATP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ProDom; PD002350; APS_kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PP-MOTIF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADENYLYLTRANSFERASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6.2%; s
100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            70794 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; U34883; AAC52328.1; -.
                                                                                 Mus musculus (Mouse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            624 AA;
                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                              NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        59
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                                                                                                                                                                                                          TISSUE=Brain;
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ACT_SITE
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This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                 -i- SIMILARITY: BELONGS TO THE APS KINASE FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                               -!- PATHWAY: SECOND STEP IN THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF METHIONINE AND CYSTEINE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6
                               30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
40-MAY-2000 (Rel. 39, Last annotation update)
50-Mosphosulfate kinase (EC 2.7.1.25) (MSPS kinase) (Adenosine-5'phosphosulfate kinase) (ATP adenosine-5'-phosphosulfate 3'-
                                                                                                                                                                            Eukaryota; Fungi; Ascomycota; Pezizomycotina; Eurotiomycetes;
Eurotiales; Trichocomaceae; Emericella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
30-MAY-2000 (Rel. 39, Last sequence update)
40-MAY-2000 (Rel. 39, Last annotation update)
50-MAY-2000 (Alase (EC 2.7.1.25) (APS kinase) (Adenosine-5'-phosphosulfate kinase) (ATP adenosine-5'-phosphosulfate 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eukaryota; Fungi; Ascomycota; Pezizomycotina; Eurotiomycetes,
                                                                                                                                                                                                                                                                 Clarke D.L., Newbert R.W., Turner G.;
Cloning and characterisation of the APS kinase gene from
Aspergillus nidulans.";
Submitted (OCT-1996) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: CATALYZES THE SYMTHESIS OF ACTIVATED SULFATE.
-|- CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
phosphoadenylylsulfate.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2.4%; Score 15; DB 1; Length 206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Transferase; Kinase; Cysteine biosynthesis; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6AADD483E2BCA1CD CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pred. No. 1.8e-07;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       211 AA
                                                                                                                                                           Emericella nidulans (Aspergillus nidulans).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Probom; PD002350; APS_kinase.
Probom; PD002350; APS_kinase; 1.
Probom; PD002350; APS_kinase; 1.
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100.08; Pic
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ProDom; PD002350; APS_kinas
TIGRFAMs; TIGR00455; apsK;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15; Conservative
STANDARD;
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                                                                                                                          phosphotransferase).
SD.
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                                                                                                                                                                                                                                                  SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Phosphorylation.
NP_BIND 31
ACT_SITE 105
                                                                                                                                                                                                                  NCBI_TaxID=5072;
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Q12657;
KAPS_EMENI
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Gaps

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0; Mismatches

38; Conservative

Best Local Similarity

Matches

Eurotiales; Trichocomaceae; mitosporic Trichocomaceae; Penicillium.

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BIOSYNTHETIC PATHWAY.
SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            276 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                       100.0%; Pred. nc.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT;
                                                                                                                                                                                                                                                                                                                                  Phosphorylation; Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-94325358; PubMed-8049272;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=94345022; PubMed-8066145;
                                                                                                                                                                                                                                                                  Probom; PD002350; APS_kinase; 1.
                                                                                                                                                                                                                                    InterPro; IPR002891; APS_kinase.
Pfam; PF01583; APS_kinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Plant Physiol. 105:771-772(1994).
                                                                                                                                                                                                                                                                                                                                                                                                          177 AA; 19674 MW;
                                                                                                                                                                                                                  EMBL; D90902; BAA16957.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=cv. Landsberg erecta;
                                                                                                                                                                                                                                                                                                                                                                                                                                               2.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         46 WLTGLSGAGKTTI 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9 WLTGLSGAGKTTI 21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 Similarity 100.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
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043295;
                                                                                                                                                                                                                                                                                                                                                NP_BIND
ACT_SITE
                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
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                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration between the SWISS Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         30-MX-2000 (Rel. 39, Created)
30-MX-2000 (Rel. 39, Last sequence update)
16-GCT-2001 (Rel. 40, Last annotation update)
Probable adenylylsulfate Kinase (EC 2.7.1.25) (APS Kinase) (Adenosine-5'phosphosulfate Xinase) (ATP adenosine-5'-phosphosulfate 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Kaneko T., Sato S., Kotani H., Tanaka A., Asamizu E., Nakamura Y., Miyajima N., Hirosawa M., Sugiura M., Sasamoto S., Kimura T., Hosouchi T., Matsuno A., Muraki A., Nakazaki N., Naruo K., Okumura S., Shimpo S., Takeuchi C., Wada T., Watanabe A., Yamada M., Yasuda M., Tabata S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
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--- PATHWAY: SECOND STEP IN THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF METHIONINE AND CYSTEINE.
--- SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Sequence analysis of the genome of the unicellular cyanobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         phosphoadenylylsulfate.
PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ö
                                                                                         Submitted (OCT-1995) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
-!- CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 211;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Transferase; Kinase; Cysteine biosynthesis; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7DDC4BDA867FE7C2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cyanobacteria; Chroococcales; Synechocystis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 15; DB 1; Le
Pred. No. 1.8e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATP (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           177 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No. 1.8
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (strain PCC 6803).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2.4%; Sco.
100.0%; Pre
0;
                                                                                                                                                                                                                                                                                                                                                                                                                   InterPro; IPR002891; APS_kinase.
Pfam; PF01583; APS_kinase; 1.
ProDom; PD002350; APS_kinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A. MEDLINE-97061201; PubMed-8905231;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             211 AA; 23770 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          98 ENIRRIAEVAKLFAD 112
                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; U39393; AAA81521.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TIGREAMS; TIGRO0455; apsk;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               phosphotransferase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                         STRAIN-ATCC 24791;
                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Synechocystis sp.
NCBI_TaxID=5076;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Phosphorylation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     32
107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=1148;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CYSC OR SLR0676
                                                                           Foster B.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ma.
Local S...
15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CYSC_SYNY3
P72940;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ACT_SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BIND
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Matches
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                                                                                                                                                                                                                                                                                                                   ATP (BY SIMILARITY).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     16-OCT-2001 (Rel. 40, Last annotation update)
Adenylylsulfate kinase 1, chloroplast precursor (EC 2.7.1.25) (APS kinase) (Affordsine-5'-phosphosulfate kinase) (AFP adenosine-5'-phosphosulfate 3'-phosphosulfatese).
AKN1 OR ATG14750 OR F26C24.11 OR F6B13.1.
Arabidopsis thaliana (Mouse-ear cress).
Bukaryota: Viridiplantae: Streptophyta; Embryophyta; Tracheophyta; Spermatophyta: Magnollophyta; eudicotyledons; core eudicots; Rosidae; eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Jain A., Leustek T.; "A cDNA clone for 5'-adenylylphosphosulfate kinase from Arabidopsis thaliana.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Leustek T.; "Analysis of ATP-sulfurylase and APS-kinase genomic DNA sequences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Arz H.E., Gisselmann G., Schiffmann S., Schwenn J.-D.,
"A cDNA for adenylyl sulphate (APS)-kinase from Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                          Score 13; DB 1; Length 177;
Pred. No. 1.8e-05;
                                                                                                                                                                                                                                                   TIGREAMS; TIGRO0455; apsK, 1.
Transferase; Kinase; Cysteine biosynthesis; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (JUN-1996) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                          SIMILARITY).
E24D5B5452FCD7D8 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
STRAIN=cv. Columbia;
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STRAIN=cv. Columbia;
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     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATP (POTENTIAL). FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Arabidopsis thaliana (Mouse-ear cress).
Eukaryota, Viridiplantae, Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
eurosids II; Brassicales; Brassicaeee; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
MEDLINE=20083487; PubMed=10617197;
Lin X., Kaul S., Rounsley S.D., Shea T.P., Benito M.-I., Town C.D.,
Fujii C.Y., Mason T.M., Bowman C.L., Barnstead M.E., Feldblyum T.V.,
Buell C.R., Ketchum K.A., Lee J.J., Ronning C.M., Koo H.L.,
Moffat K.S., Cronin L.A., Shen M., Pai G., Van Aken S., Umayam L.,
Tallon L.J., Gill J.E., Adams M.D., Carrear A.J., Creasy T.H.,
Goodman H.M., Somerville C.R., Copenhaver G.P., Preuss D.,
Nierman W.C., White O., Eisen J.A., Salzberg S.L., Fraser C.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30-MXY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
30-MAY-2001 (Rel. 40, Last aequence update)
Adenylylsulfate kinase 2, chloroplast precursor (EC 2.7.1.25) (APS kinase) (Adenosine-5'phosphosulfate kinase) (ATP adenosine-5'-
                                                                                                                                                                                       phosphoadenylylsulfate.
PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS
REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE
                                                                                                                       'Sequence and analysis of chromosome 2 of the plant Arabidopsis
                                                                                                                                                             -i- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2.0%; Score 12; DB 1; Length 276;
100.0%; Pred. No. 0.00029;
tive 0; Mismatches 0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Transferase: Kinase: Cysteine biosynthesis: ATP-binding; Phosphorylation; Transit peptide; Chloroplast.
TRANSIT 1 37 CHLOROPLAST (POTENTIAL).
CHAIN 38 276 ADENYLYLSULFATE KINASE 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CB698643AA09D811 CRC64;
                                                                                                                                                                                                                                    BIOSTNIHETIC PATHWAI.
-1 - SUBCELLULAR LOCATION: Chloroplast.
-1 - SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT; ' 293 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            phosphosulfate 3'-phosphotransferase).
AKN2 OR AT4G39940 OR T5J17.110.
                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL, AC004705; AAC24182.1; --
InterPro; IPR002891; APS_kinase.
Jefam, PP010583; APS_kinase; 1.
ProDom; PD002350; APS_kinase; 1.
TIGRFAMS; TIGR00455; apsK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           276 AA; 29787 MW;
                                                                                                                                                                                                                                                                                                                                                                                       EMBL; X75782; CAA53426.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; U05238; AAC50035.1; -. EMBL; U59759; AAC50034.1; -.
                                                                                                                                                Nature 402:761-768(1999).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 135 LDGDNVRHGLNR 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Best Local Similarity 100. Matches 12; Conservative
                                                                                                                                                                                                                                BIOSYNTHETIC PATHWAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        76 LDGDNVRHGLNR 87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=3702;
                                                                                                            Venter J.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KAP2_ARATH
049196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NP_BIND
ACT_SITE
                                                                                                                                     thaliana.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 10
KAP2_ARATH
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SEOUENCE FROM N.A.

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RESTRINGON COLUMBIA:

RAYER TRIANCON COLUMBIA:

RAYER TRIANCOLUMBIA:

RAYER MEDITICAL COLUMBIA:

RAYER MEDITICAL COLUMBIA:

RAYER MEDITICAL C. WanDULT R., Murphy G., Volckaert G.,

RAYER MEDITICAL C. STERKEMBA W., Entian R., Folger M.,

RAYER MEDITICAL C. WanDULT B., Macher R., Muclier M.,

RAYER MEDITICAL M., de Simone V., Obermaier B., Macher R., Muclier M.,

RAYER M., Delseny M., Pludgemench P., Watson M., Schmidtheini T.,

RAYER M., Molisal D., Milmermann M., Wedler H., Ridley P.,

Langham S.-A., McCulligh B., Ellham L., Robben J., Vandenbussche F.,

RAYER MEDITICAL M., Molid M., Macher M., Macher M., Dirks W.,

RAYER M., Berandt A., Beder S., Van Staveren M., Dirks W.,

RAYER M., Molidan D., Klafn Lankhorst R., Rose M., Haul J., Koetter P.,

RAYER M., Molidan D., Klafn Lankhorst R., Rose M., Haul J., Koetter P.,

RAYER M., Robers A., Buysshaert C., Gielen J., Villabrorel R., De Clercq R.,

RAYER M., Robers A., Buysshaert C., Gielen J., Villabrorel R., De Clercq R.,

RAYER M., Robers A., Buysshaert C., Gielen J., Villabrorel R.,

RAYER M., Robers A., Buysshaert C., Gielen J., Villabrorel R.,

RAYER M., Robers A., Buysshaert C., Gielen J., Villabrorel R.,

RAYER M., Robers A., Buysshaert C., Monfort A., Qualler M., Lenbert S.,

RAYER M., RAYAHLE M., Scharfer M., Lenbert R., Mellay R.,

RAYER M., Moliday R., Klafale D., Klafale D., Molor R.,

RAYER M., Mayes R., Cooke R., Barger C., Monfort A., Gasacuberta E.,

RAYER M., Moliday R., Villale D., Liguori R., Plance C.,

RAYER M., Moliday R., Villale D., Molor R., Aubourta S.,

RAYER M., Moliday R., Villale D., Molor R., Stocker S.,

RAYER M., Moliday R., Villale D., Molor R., Aubourta S.,

RAYER M., Moliday R., Villale D., Molor R., Aubourta S.,

RAYER M., Molor R., Percence R., Mewes H.-R., Stocket R.,

RAYER M., Moliday R., Wilson B., Molor R., Aubourt A., Stocket R.,

RAYER M., Moliday R., Stender P., Cordes M., Abbott A., Stocket R.,

RAYER M., Moliday R., Stender P., Cordes M., Abbott A., Socket R.,

RAYER M., Moliday R., Stender P., Cordes M., Abbott M., 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL outstation
Schiffmann S., Schwenn J.-D.; "Isolation of cDNA clones encoding adenosine-5'-phosphosulfate-kinase (EC2.7.1.25) from Catharanthus roseus and an isoform (akn2) from Arabidopsis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                phosphoadenylylsulfate.
-!- PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -i- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      between the Swiss Institute of Bioinformatics and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BIOSYNTHETIC PATHWAY.
-:- SUBCELLULAR LOCATION: Chloroplast (By similarity).
-:- SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                        (In) Plant Gene Register PGR98-116.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nature 402:769-777(1999)
                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
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RESULT
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                                                                                                                                                                                                                                                                                                                                                                                               16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
CysN/cysC bifunctional enzyme [Includes: Sulfate adenylyltransferase]
subunit 1 (EC 2.7.7.4) (Sulfate adenylate transferase) (SAT) (ATP-
sulfurylase large subunit); Adenylylsulfate kinase (EC 2.7.1.25) (APS
kinase) (ATP adenosine-5'-phosphosulfate 3'-phosphotransferase)].
                                                                                                                                                        ATP (POTENTIAL).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                        ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria; gamma subdivision; Xanthomonas group;
EMBL; AF043351; AAC39520.1; -.

REMBL; AL161596; CAB80657.1; -.

RICAPTO; IPR002891; APS_Ainase.

R Pfam; PF01583; APS_Kinase; 1.

R TGRFAMS; TGR00455; apsK; 1.

R Transferase; Kinase; Cysteine biosynthesis; ATP-binding; Phosphorylation; Transit peptide; Chloroplast.

W Transferase; Kinase; Cysteine biosynthesis; ATP-binding; TRANSIT 1 ? CHLOROPLAST (POTENTIAL).

TRANSIT 1 ? 293 ADENILYLSULFARE KINASE 2.
                                                                                                                                                                                                                           71F1AD6E9B026886 CRC64;
                                                                                                                                                                                                                            2.0%; Score 12; DB 1;
                                                                                                                                                                                                                                                                                                                                                                            623 AA.
                                                                                                                                                                                      SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                            100.08; PIC
                                                                                                                                                                                                 293 AA; 31977 MW;
                                                                                                                                                                                                                                                                                            Query Match 2.0
Best Local Similarity 100.
Matches 12; Conservative
                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                              76 LDGDNVRHGLNR 87
                                                                                                                                            293
149
196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Xylella fastidiosa.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=2371;
                                                                                                                                                        142
196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CYSNC OR XF1501
                                                                                                                                                                                                                                                                                                                                                                        CYSN_XYLFA
Q9PD78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=9a5c
                                                                                                                                                         NP_BIND
ACT_SITE
                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    xvlella
                                                                                                                                                                                                                                                                                                                                                            CYSN_XYLFA
                                                                                                                                                                                                                                                                                                                                              RESULT 11
           δ
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between the Swiss Institute of Bioinformatics and the EMBL outstation-
the European Bioinformatics Institute. There are no restrictions on its
use by non-profit institutions as long as its content is in no way
modified and this statement is not removed. Usage by and for commercial
entities requires a license agreement (see http://www.isb-sib.ch/announce/
or send an email to license@isb-sib.ch).
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                                                                                                 (BY SIMILARITY).

(BY SIMILARITY).

(CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate.

(CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3' -

phosphoadenylylsulfate.

PATHWAY: FIRST AND SECOND STEPS IN THE SULFATE ACTIVATION PATHWAY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-0CT-1996 (Rel. 34, Created)
01-0CT-1996 (Rel. 34, Last sequence update)
16-0CT-2010 (Rel. 40, Last annotation update)
16-0CT-2011 (Rel. 40, Last annotation update)
16-0CT-3011 (Rel. 40, Last annotation update)
16-0CT-3011 (Rel. 40, Last annotation update)
16-0CT-2011 (Rel. 40, Last annotation u
                                                                          OF ACTIVATED SULFATE
                                                                                                                                                                                                                                                                                                                                                                                                       CYSN (BY SIMILARITY).
SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE GTP-BINDING ELONGATION FACTOR FAMILY. CYSN/NODQ SUBFAMILY.
SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTP (BY SIMILARITY).

GTP (BY SIMILARITY).

GTP (BY SIMILARITY).

ATP (POTEWTIAL).

FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                         THESE REACTIONS OCCURE EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE BIOSYNTHETIC PATHWAY.
SUBUNIT: HETERODIMER COMPOSED OF CYSD, THE SMALLER SUBUNIT, AND
FUNCTION: ATP SULFURYLASE MAY BE THE GTPASE, REGULATING ATP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ó
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PSOSTEE: PSO0301; BFSCTON GTP; 1.

Cysteine biosynthesis; Transferase; Nucleotidyltransferase; GTP-binding; Kinase; ATP-binding; Multifunctional enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 12; DB 1; Length 623;
Pred. No. 0.00058;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SULFATE ADENYLYL TRANSFERASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0; Indels
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C20730A365B28E94 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADENYLYLSULFATE KINASE
                           SULFURYLASE ACTIVITY (BY SIMILARITY).
FUNCTION: APS KINASE CATALYZES THE SYNTHESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       632 AA.
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tive 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AE003980; AAF84310.1; ALT_INIT.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Interpro; IPR002891; APS_kinase.
Interpro; IPR004161; EFTU_D2.
Interpro; IPR000195; EF_GTPbind.
Pfam; PP00009; GTP_EFTU; 1.
Pfam; PP01583; APS_kinase; 1.
PRINTS; PR00315; ELONGATNFCT.
ProDom; PD002350; APS_kinase; 1.
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23
102
157
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P52978;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FAMILY.
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ACT_SITE
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NP_BIND
NP_BIND
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RESULT 13
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                                                                                                                                                                                                                                                                                                                                                                   -!- SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE GTP-BINDING ELONGATION FACTOR FAMILY. CYSN/NODQ SUBFAMILY.
-!- SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -1- CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae group;
                                                                                                                                                                                                           "Isolation and characterization of Rhizobium tropici Nod factor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              phosphoadenylylsulfate.
SUBUNIT: SULFATE-ACTIVATING ENZYMES, NODP AND NODQ, MAY BE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TIGREAMS; TIGRO0455; apsK; 1.
PROSITE; PS00301; EFACTOR_GTP; 1.
Nodulation; Transferase; Nucleotidyltransferase; GTP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 1; Length 632; 0.00059;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Multifunctional enzyme.

SULFATE ADENYLYL TRANSFERASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BFA3DF0CC7C604B6 CRC64;
                                                                                                                                                          Laeremans T., Caluwaerts I., Verreth C., Rogel M.A.,
Vanderleyden J., Martinez-Romero E.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADENYLYLSULFATE KINASE. GTP (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (BY SIMILARITY).
                                                                                                                                                                                                                                                         Mol. Plant Microbe Interact. 9:492-500(1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SIMILARITY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro; IPR002891, APS_kinase.
InterPro; IPR004161; EFTU_D2.
InterPro; IPR000795; EF_GTPbind.
Pfam; PF00009; GTP_EFTU, 1.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF03144; GTP_EFTU_D2; 1.
                                                                                                                STRAIN=CFN 299;
MEDLINE=96303535; PubMed=8755625;
                                                                                                                                                                                                                                                                                                                            STRAIN-CIAT899;
MEDLINE-97002746; PubMed-8850086;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                69814 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; U47272; AAB08984.1; -. EMBL; X87608; CAA60914.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PHYSICALLY ASSOCIATED.
                        Rhizobium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                167
473
540
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DOMAIN 1 45
DOMAIN 458 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                632 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                        FROM N.A.
                                                                                                                                                                                                                                      sulfation genes.
                        Rhizobiaceae; R
NCBI_TaxID=398;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NP_BIND
ACT_SITE
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                                                    15-DEC-1998 (Rel. 37, Last sequence update)
16-OCT-2001 (Rel. 40, Last sequence update)
NodO bifunctional enzyme (Nodulation protein Q) [Includes: Sulfate adenylyttransferase subunit 1 (EC 2.7.7.4) (Sulfate adenylate transferases) (SAT) (ATP-sulfurylase large subunit); Adenylylsulfate kinase (EC 2.7.1.25) (APS kinase) (ATP adenosine-5'-phosphosulfate 3/-phosphotransferase)].
                                                                                                                                                                                                                                                                                                                                                                                                                     Rhizoblum Sp. BRR16.";
Microbiology 143:3933-3942(1997).
-!- FUNCTION: PROPOSED TO PROVIDE ACTIVATED SULFATE FOR TRANSFER TO NOD FRYCTOR. ATP SULFURYLASE MAY BE THE GTPASE, REGULATING ATP SULFURYLASE ACTIVITY (BY SIMILARITY).
-!- FUNCTION: APS KINASE CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate. CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-phosphoadenylylsulfate. SUBUNIT: SULFATE-ACTIVATING ENZYMES, NODP AND NODO, MAY BE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PHYSICALLY ASSOCIATED (POTENTIAL).

SINLIARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE GTP-BINDING ELONGATION FACTOR FAMILY. CYSN/NODO SUBFAMILY.

SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADENYLYLSULFATE KINASE.

GTP (BY SIMILARITY).

GTP (BY SIMILARITY).

GTP (BY SIMILARITY).

ATP (POTENTIAL).

FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                Laeremans T., Coolsaet N., Verreth C., Snoeck C., Hellings N., Vanderleyden J., Martinez-Romero E.; "Functional redundancy of genes for sulphate activation enzymes in
                                                                                                                                                                                                                              Rhizobium sp. (strain BR816).
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROSITE; PS00301; EFACTOR GTP; 1.
Nodulation; Transferase; Nucleotidyltransferase; GTP-binding;
Kinase; ATP-binding; Multifunctional enzyme.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SULFATE ADENYLYL TRANSFERASE.
                633 AA.
                  PRT;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Probom; PD002350; APS_kinase; 1.
TIGRFAMS; TIGR00231; small_GTP; 1.
TIGRFAMS; TIGR00455; apsK; 1.
                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
MEDLINE=98083747; Pubmed=9421916;
                  STANDARD;
                                                                                                                                                                                                                                                                       Rhizobiaceae; Rhizobium.
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                                                                                                                                                                                                                                                                                     NCBI_TaxID=48291;
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                NODQ_RHISB
007309;
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ACT_SITE
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DOMAIN
NP_BIND
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NODQ_RHISB
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Gaps

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0; Indels

Pred. No. 0.( 0, Mismatches

100.08;

Conservative

Local Similarity nes 12; Conserv

Best Loc Matches

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phosphotransferase)]
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es 12; Conserv
                                                                                                                                                                                                                                                                                                           641 AA;
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                                                                                                                                                                                                                                                                      165
467
524
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P72339;
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NP_BIND
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NP_BIND
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate. CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                         01-JAN-1990 (Rel. 13, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
NodQ bifunctional enzyme (Nodulation protein Q) [Includes: Sulfate adenylltransferase subunit 1 (EC 2.7.7.4) (Sulfate adenylate transferase) (SAT) (ATP-sulfurylase large subunit); AdenylyLsulfate kinase (EC 2.7.1.25) (APS kinase) (ATP adenosine-5'-phosphosulfate 3'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PHYSICALLY ASSOCIATED (POTENTIAL).
SINLIARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE GTP-BINDING ELONGATION FACTOR FAMILY. CYSN/NODO SUBFAMILY.
SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                                                                                                                                                         Schwedock J., Long S.R.;
"Nucleotide sequence and protein products of two new nodulation genes
                                               Gaps
                                                                                                                                                                                                                                          Plasmid pSymA (megaplasmid 1).
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae group;
Rhizobiaceae; Sinorhizobium.
                                              ö
                                                                                                                                                                                                                                                                                                 STRAIN=RCR2011 / SU47;
MEDLINE-89313304; PubMed-2546009;
Cervantes E., Sharma S.B., Maillet F., Vasse J., Truchet G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           phosphoadenylylsulfate.
SUBUNIT: SULFATE-ACTIVATING ENZYMES, NODP AND NODQ, MAY
                            Length 633;
       696BCA683D4B3111 CRC64;
                           DB 1; Le
                                                                                                                                                                                                               phosphotransferase)].
NODQ OR RA0469 OR SMA0857.
Rhizobium meliloti (Sinorhizobium meliloti).
                                                                                                                                                                                                                                                                                                                                                                                                            of Rhizobium meliloti, nodP and nodQ.";
Mol. Plant Microbe Interact. 2:181-194(1989).
                                                                                                                               641 AA.
                                 100.0%; Preu. ...
SIMILARITY).
                          Score 12;
Pred. No.
                                                                                                                              PRT;
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                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A. MEDLINE=92288403; PubMed=2520820;
                                                                                                                                                 01-JAN-1990 (Rel. 13, Created)
        69279 MW;
                           2.0%;
                                                                           STANDARD;
                                             Conservative
                                                               76 LDGDNVRHGLNR 87
                Query Match
Best Local Similarity
Thes 12; Conserve
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         AA;
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        633
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                                                                                                                              NODQ_RHIME
        SEQUENCE
                                                                                                                     NODQ_RHIME
                                                                                                            RESULT 14
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                                                                       use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROSITE; PS00301; EFACTOR_GTP; 1.
Plasmid; Nodulation: Transferase; Nucleotidyltransferase; GTP-binding; Kinase; ATP-binding; Multifunctional noryme; Complete proteome.

1 458 SULFATE ADENYLYL TRANSFERASE.

DOMAIN 459 641 ADENYLYLSULFATE KINASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Cloutier J.;
Submitted (APR-1996) to the EMBL/GenBank/DDBJ databases.

-!-FUNCTION: PROPOSED TO PROVIDE ACTIVATED SULFATE FOR TRANSFER TO

-!-FUNCTION: APP SULFUTYLASE MAY BE THE GTPASE, REGULATING ATP

SULFURYLASE ACTIVITY (BY SIMILARITY).

-!-FUNCTION: APS KINASE CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE

(BY SIMILARITY).
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-i- CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTP (BY SIMILARITY).
GTP (BY SIMILARITY).
GTP (POTENITAL).
ATP (POTENITAL).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
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15-DEC-1998 (Rel. 37, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
NodO bifunctional enzyme (Nodulation protein O) [Includes: Sulfate adenylyltransferase subunit 1 (EC 2.7.7.4) (Sulfate adenylate transferase) (SAT) (ATP-sulfurylase large subunit); Adenylylsulfate kinase (EC 2.7.1.25) (APS Kinase) (ATP adenosine-5'-phosphosulfate
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ö
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Pred. No. 0.0006;
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INTERPRO: IPRO02891; APS. Kinase.
INTERPRO: IPRO04161; EFTU_D2.
INTERPRO: IPRO05255; Small_GTP.
Pfam, PF00009; GTP_EFTU_I.
Pfam; PF01883; APS. Kinase; I.
Pfam; PF03144; GTP_EFTU_D2; I.
Pfam; PF03144; GTP_EFTU_D2; I.
PTGNOMN; PD002356; APS. Kinase; I.
TIGREAMS; TIGR00231; small_GTP: I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            70614 MW;
                                                                                                                                                                                                                                       EMBL; X14809; CAA32914.1; -.
EMBL; M68858; AAA26343.1; -.
EMBL; AE007237; AAK65127.1; -
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NCBI_TaxID=103798;
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474
524
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               PHYSICALLY ASSOCIATED (FOTENTIAL).
-!- SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE GTP-BINDING ELONGATION FACTOR FAMILY. CYSN/NODG SUBFAMILY.
-!- SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATP (POTENTIAL).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
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                                                                                                                                                                                                                                                                             InterPro; IPR002891; APS_kinase.
InterPro; IPR004161; EFTU_D2.
InterPro; IPR004161; EFTU_D2.
InterPro; IPR000795; EF_GTPbind.
Pfam; PP010095; GTP_EFTU; 1.
Pfam; PF03144; GTP_EFTU_D2; 1.
ProDom; PD002350; APS_Kinase; 1.
TIGRFAM5; TGR00455; apsK; 1.
PROSITE; PS00301; EFACTOR_GTP; 1.
PROSITE; PS00301; EFACTOR_GTP; 1.
Nodulation; Transferase; Nucleotidyltransferase; GTP-binding; Kinase; ATP-binding; Miltifunctional enzyme.

Ninase; ATP-binding; Miltifunctional enzyme.

DOMAIN
SULFATE-ACTIVATING ENZYMES, NODP AND NODQ, MAY BE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 1; Leny...
5. 0.0006; Indels
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1DBEE1DA257FE128 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADENYLYLSULFATE KINASE
GTP (BY SIMILARITY).
GTP (BY SIMILARITY).
GTP (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 12; DB 1; Pred. No. 0.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                71488 MW;
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                                                                                                                                                                                                                                                   EMBL; U53327; AAB16902.1; -
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Best Local Similarity 100.
Matches 12; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                646 AA;
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ACT_SITE
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NP_BIND
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Search completed: May 30, 2003, 12:30:43 Job time: 24 secs

### 111111111111111 497 LDGDNVRHGLNR 508

76 LDGDNVRHGLNR 87

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098594 rhizobium 1
098594 arabidopsis
098179 arabidopsis
091351 enteromorph
096 fyx arabidopsis
09882 caulobacter
08983 caulobacter
08770 clostridium
09771 klebsiella
08774 salmonella
08734 salmonella
08739 saccharomyc
08295 saccharomyc
08295 saccharomyc
08295 saccharomyc
092wm0 oryza sativ

04888 zea mays (m

096349 brassica na

095znz8 brassica ju

042520 arabidopsis

095324 arabidopsis

093324 arabidopsis

093786 arabidopsis

09378 arabidopsis

09578 arabidopsis

09578 arabidopsis

09578 arabidopsis

095879 brassica ol

096541 brassica ol

096541 brassica ol

096548 drosophila

099w48 drosophila

099w48 drosophila

099w48 drosophila

099w49 drosophila

099w4 drosophila

099w4 drosophila

099w4 drosophila

099w4 drosophila
                         Q96349
Q9ZNZ8
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023324
02957D8
092NZ9
043870
08RWJ3
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09FJX1
09A882
08YEX3
097MT8
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Q9P7G9
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615
1 MSGIKKQKTENQQKSTNVVY.....MAPKAWKVLTDYYRSEMDKN 615
                                                         May 30, 2003, 12:26:25 ; Search time 87 Seconds
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        GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
                                                                                                                                                                                      parameters:
                                                                                                                                                    671580 seqs, 206047115 residues
                                                                                                                                                                                                                              Post-processing: Listing first 1000 summaries
                                        OM protein - protein search, using sw model
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Gapop 60.0 , Gapext 60.0
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Maximum DB seq length: 2000000000
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sp_human:*
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Word size :

Database

searched:

Scoring table:

Title: Perfect score:

Run on:

Sequence:

## ALIGNMENTS

Description	Oguirz homo sapien	Q9qys0 mus musculu Q9jk86 cavia porce	Q9ue98 homo sapien	Q9p1p9 homo sapien	Q96tf4 homo sapien.	090xy2 fugu rubrip	Ogndp8 ciona intes	Q43170 solanum tub	Q8w1x3 allium cepa	Q9sdp4 allium cepa	Q8saq1 qlycine max	042519 arabidopsis	Q9se02 arabidopsis	Q43183 solanum tub	Q9lik9 arabidopsis
SUMMARIES B ID	4 Q9UIR2	11 Q9UYSU 11 Q9JK86	4 Q9UE98	4 Q9P1P9	4 Q96TF4	13 Q90XY2	5 Q9NDP8		10 Q8W1X3	10 Q9SDP4	10 Q8SAG1	10 Q42519	10 Q9SE02	10 Q43183	10 Q9LIK9
% Query Match Length DB	265	620	624	624	624	613	618	424	458	461	461	463	463	463	463
% Query Match 1	23.1	9.4	6.3	6.2	6.2	0.9	4.2	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Score	142	28 28	38	38	38	37	26	22	22	22	22	22	22	22	22
Result No.		3 6	4	2	9	7	80	σ	10	11	12	13	14	. 15	16

MEDLINE=20026854; PubMed=10559207;
MEDLINE=20026854; PubMed=10559207;
Rurima K., Singh B., Schwartz N.B.;
Rurima K., Singh B., Schwartz N.B.;
Genomic organization of the mouse and human genes encoding the ATP Sulfurylase/Adenosine 5'-phosphosulfate kinase isoform SK2.";
J. Biol. Chem. 274-33306-33312(1999).
EMBL; AR173364; AAF12780.1; JOINED.
EMBL; AR173361; AAF12780.1; JOINED.
EMBL; AR173363; AAF12780.1; JOINED.
EMBL; AR173363; AAF12780.1; JOINED.
InterPro; IPR002650; ATP-sulfurylase.
Pfam; PF01747; ATP-sulfurylase; 1.

SEQUENCE FROM N.A.
MEDLINE=98337975; PubMed=9671738;
Kuriana K., Warman M.L., Krishnan S., Domowicz M., Krueger R.C. Jr.,
Kuriana K., Schwartz N.B.;
"A member of a family of sulfate-activating enzymes causes murine
brachymorphism.";

Proc. Natl. Acad. Sci. U.S.A. 95:8681-8685(1998).

Homo sapiens (Human). Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

NCBI\_TaxID=9606;

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

sp\_vertebrate:\*
sp\_unclassified:\*

sp\_rodent:\*

sp\_plant:\* sp\_virus:\*

sp\_phage:\*

sp\_organelle:\*

sp\_mammal:\* sp\_mhc:\*

sp\_bacteriap:\*

sp\_rvirus:\*

sp\_archeap:\*

01-MAY-2000 (TrEMBLrel. 13, Created)
01-MAY-2000 (TrEMBLrel. 13, Last sequence update)
01-MAR-2002 (TrEMBLrel. 20, Last annotation update)
ATP sulfurylase/APS kinase isoform SK2 (EC 2.7.7.4) (Fragment).

265 AA.

PRT;

PRELIMINARY;

Q9UIR2 RESULT 1 Q9UIR2

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Query Match
Best Local S:
Matches 81,
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Best Local 3
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                                                                                                                                                                                                                        427 RRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPML 486
                                                                                                                                                                                                                                               487 YAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAPGLTSVE 546
                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-20026854; PubMed-10559207;
Kurima K., Singh B., Schwartz N.B.;
"Genomic organization of the mouse and human genes encoding the ATP Sulfurylase/Adenosine 5'-phosphosulfate kinase isoform SK2.";
D. Biol. Chem. 274:33306-33312(1999).
EMBL; AF172866; AAF12760.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mus musculus (Mouse).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE-98337975; PubMed-9671738;
Kurima K., Warman M.L., Krishnan S., Domowicz M., Krueger R.C. Jr.
Deyrup A., Schwartz N.B.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "A member of a family of sulfate-activating enzymes causes murine brachymorphism.";
                                                                                                                                                                             ö
                                                                                                                          23.1%; Score 142; DB 4; Length 265; 100.0%; Pred. No. 1.5e-145; .ive 0; Mismatches 0; Indels
                                                                       265 AA; 30142 MW; D75A237,4E40C334F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kinase; Nucleotidyltransferase; Transferase.
SEQUENCE 621 AA; 70408 MW; 019519DC8E239F68 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-MAY-2000 (TrEMBLrel. 13, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
ATP sulfurylase/APS kinase isoform SK2 (EC 2.7.7.4)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Proc. Natl. Acad. Sci. U.S.A. 95:8681-8685(1998).
ProDom; PD002381; ATP-sulfurylase; 1.
Kinase; Nucleotidyltransferase; Transferase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           621 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMEL, AF172857, AAF12760.1; JOINED. BMEL; AF172858; AAF12760.1; JOINED. BMEL; AF172869; AAF12760.1; JOINED. BMEL; AF172869; AAF12760.1; JOINED. BMEL; AF172861; AAF12760.1; JOINED. BMEL; AF172863; AAF12760.1; JOINED. BMEL; AF172864; AAF12760.1; JOINED. BMEL; AF172864; AAF12760.1; JOINED. BMEL; AF172865; AAF12760.1; JOINED. BMEL; AF172865; AAF12760.1; JOINED.
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ProDom; PD002381; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Created)
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InterPro; IPR002650; ATP-sulfurylase
                                                                                                                                                                                                                                                                                                                                                                                                                Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
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                                                                                                                                                 Best Local Similarity 100. Matches 142; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Papss2
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SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-C57BL/6;
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                                                  NON_TER
SEQUENCE
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                                                                                                                          Query Match
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                                                                                                                                                                                                                    109 LFADAGLVCITSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRAR 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    50S. RMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNK 562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       500 RMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNK 557
                                                                                          Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-0CT-2000 (TrEMBLrel. 15, Created)
1-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2000 (TrEMBLrel. 15, Last annotation update)
Adenosine 5'-phosphosulfate kinase/ATP sulfurylase 2.
Cavia porcellus (Guinea pig).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia.
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Mono sapiens (Human).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
Fuda H., Strott C.A.;
Submitted ply bifunctional adenosine 5'-phosphosulfate kinase/ATP
sulfurylase 2, gppApS synthase 2.";
Submitted (APR-2000) to the EMBL/GenBank/DDBJ databases.
EMBL, AFS1798; AAF70194 L.1.
InterPro; IPR00269; AAPS_kinase.
InterPro; IPR002650; ATP-sulfurylase.
Pfam; PF01747; ATP-sulfurylase; 1.
ProDom; PD002350; APS_kinase; 1.
ProDom; PD002350; APS_kinase; 1.
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Length 621;
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01-MAY-2000 (TrEMBLrel. 13, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
13.2%; Score 81; DB 11; 1 100.0%; Pred. No. 9.2e-79;
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Pred. No. 1e-53;
0; Mismatches 0
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                      100.0%; Pred. ...
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InterPro; IPR002650; ATP-sulfurylase.
Pfam; PF01583; APS_Kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
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                                                                                                                                                                                                                                                                                                                                                                                                170 AGEIKGFTGIDSDYEKPETPE 190
                                                                                                                                                                                                                                                                                                                                                   169 AGEIKGFTGIDSDYEKPETPE 189
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| Similarity 100.0%; Pr
58; Conservative 0;
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                                                                                          Conservative .
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                                             Similarity
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                                                                                     81;
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TISSUE=EYE;
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       RAHRET REPRESENTATION OF STANFORM OF STANF
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                                                                                                                                                                                                  Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Wood T.C.,
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Xu Z.-H., Otterness D.M., Freimuth R.R., Carlini E.J., Wood
Mitchell S., Moon E., Kim U.-J., Xu J.-P., Siciliano M.J.,
Weinshilboum R.M.;
                                                                                                                                               DB 4; Length 624; 6.2e-32;
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Eutele
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6.2%; Score 38; DB 4; Length 624 100.0%; Pred. No. 6.2e-32; Live 0; Mismatches 0; Indels
                                                                                              70881 MW; 0008DBC57B6F35BC CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-ocr-2000 (TrEMBLrel. 15, Created)
01-ocr-2000 (TrEMBLrel. 15, Last sequence update)
01-JUN-2002 (TrEMBLrel. 12), Last annotation update)
17-phosphoadenosine 5'-phosphosulfate synthetase.
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01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
3'-phosphoadenosine 5'-phosphosulfate synthetase.
                                                                                                                                                                                                                                                                     10 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 67
                                                                                                                                                                                                                                           20 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT 57
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0
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                                                                                                                                            Match 6.2%; Score 38; DB Local Similarity 100.0%; Pred. No. 6.2 es 38; Conservative 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pfan: PF01583; APS_kinase; 1.
Pfan: PF01747; ATP-sulfurylase; 1.
ProDom; PD002350; APS_kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
ProDom; PD002350; APS_kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
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                                                FIGRFAMS; TIGRO0455; apsK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Homo sapiens (Human).
                                                                                                 624 AA;
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les 38; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TISSUE=BRAIN;
                                                                            Kinase.
SEQUENCE
                                                                                                                                               Query Match
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Matches
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Matches
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Q96TF4
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Q9P1P9
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Xu Z.-H., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim U.-J., Xu J.-P., Siciliano M.J., Weinshilboum R.M., "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) and PAPSS2: gene Cloning, characterization and chromosomal localization."; Biochem. Biophys. Res. Commun. 268:437-444(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
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01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-DEC-2002 (TrEMBLrel. 19, Last annotation update)
3'-phosphoadenosine 5'-phosphosulfate synthase 2.
Fugu rubripes (Japanese pufferfish) (Takifugu rubripes).
Eukaryota: Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Actinopterygii; Neopterygii; Teleostei; Buteleostei; Neoteleostei; Acanthomorpha; Acanthopterygii; Percomorpha; Tetraodontiformes; Tetraodontidae; Takifugu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Conserved synteny between the Fugu and human PTEN locus and the evolutionary conservation of vertebrate PTEN function."; oncogene 20:5554-5561(2001).

EMBL; AF32592; AAL08416.1; -
InterPro; IPR002891; APS_kinase.
PfinterPro; IPR002650; APP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
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MEDLINE=21455682; PubMed=11571655;
Yu W.P., Pallen C.J., Tay A., Jirik F.R., Brenner S., Tan Y.H.,
Venkatesh B.;
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ProDom; PD002381; AFP-sulfur\Lase; 1.
TIGREAMS; TIGRO0455; aps/; aps/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PICUCNI; FLOYLLI.
TIGREAMS; TIGRO0455; apsK; 1.
TECHTANCE 624 AA; 70833 MW; A3DC9B943E68CDD6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               67
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 4; Le
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               30 YQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6.2%; Score 38; DB 100.0%; Pred. No. 6.2
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Pfam; PF01747; APP-sulfurylase; 1.
ProDom; PD002350; APS_kinase; 1.
ProDom; PD002381; APP-sulfurylase; 1.
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InterPro; IPR002650; ATP-sulfurylase.
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EMBL, AF097712; AAF40235.1; JOINED.
EMBL, AF097714; AAF40235.1; JOINED.
EMBL, AF097714; AAF40235.1; JOINED.
EMBL, AF097715; AAF40235.1; JOINED.
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EMBL, AF097717; AAF40235.1; JOINED.
EMBL, AF097718; AAF40235.1; JOINED.
EMBL, AF097719; AAF40235.1; JOINED.
EMBL, AF097720; AAF40235.1; JOINED.
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                                                                                                                                                                                                                                                                                                                                      Strausberg R.;
Submitted (JUL-2001) to the
EMBL; AF097721; AAF40235.1;
EMBL; AF097710; AAF40235.1;
                                                                                                                                                                                                                                                                      SEQUENCE OF 22-624 FROM N.A.
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Best Local Similarity 100...
Local 38; Conservative
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InterPro; IPR002650; ATP-sulfurylase.
          Pfam; PF01747; ATP-sulfurylase;
                                                                                        Best Local Similarity
Matches 22; Conserv
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                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=4679;
                                                                                                                                                                                                                                                               ATP-sulfurylase.
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01-JUN-2002
                                                                               Query Match
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                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
Hotta K., Takahashi H., Asakura T., Saitoh B., Takatori N., Satou Y.,
Satoh N.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                  Gaps
                                                                                                                                                                                                                           Eukaryota; Metazoa; Chordata; Urochordata; Ascidiacea; Enterogona;
Phlebobranchia; Cionidae; Ciona
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Solanum tuberosum (Potato).

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Asteridae; euasterids I; Solanales; Solanaceae; Solanum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Klonus D., Hoefgen R., Willmitzer L., Riesmeier J.W.; "Isolation and characterization of two cDNAclones encoding ATP-sulfurylase from Potate by complementation of a yeast mutant."; Plant J. 6:105-112(1994).
EMBL: X75041; CAA52953.1; -.
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0
          Length 613;
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                                Indels
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                                                                                                                                                                     Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Last sequence update)
Last annotation update)
(EC 2.7.7.4).
                                                                   436 PVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDP 472
                                                      437 PVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDP 473
         DB 13; L4
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   424 AA
       6.0%; Score 37; DB
ilarity 100.0%; Pred. No. 7.4
Conservative 0; Mismatches
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                                                                                                                                                                                                                                                                                                                                                                                                  ProDom; PD002350; APS_kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                      InterPro; IPR002891; APS_kinase.
InterPro; IPR002650; ATP-sulfurylase.
                                                                                                                                                            Created)
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                                                                                                                                     PRT;
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                                                                                                                                                                                                                                                                                                                                                                                        Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-DESIREE; TISSUE-LEAF;
MEDLINE-95004649; Pubmed-7920699;
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                                                                                                                                                        01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-JUN-2002 (TrEMBLrel. 21,
                                                                                                                                                                                                                                                                                                                                                                              Pfam; PF01583; APS_kinase; 1
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                                                                                                                                     PRELIMINARY;
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       Ouery Match
Best Local Similarity
Matches 37; Conserv
                                                                                                                                                                                                                  Ciona intestinalis.
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Best Local Similarity
Matches 26; Conserv
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                                                                                                                                                                                                                                                  NCBI_TaxID=7719;
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Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; Liliopsida; Asparagales; Alliaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Allium cepā (Onion).
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; Lillopsida; Asparagales; Alliaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pither Joyce M.D., McCallum J.A.;
"Isolation of an ATP-sulfurylase CDNA clone from Allium cepa.";
"Submitted (JUL-2001) to the EMBL/GenBank/DDBJ databases.
EMBL, AF403295; AF61615.1;
InterPro; IPR002650; ATP-sulfurylase.
Probom: PF00747; ATP-sulfurylase; 1.
Probom: PF003381; ATP-sulfurylase; 1.
SEQUENCE 458 AA; 51360 MW; F7A43A53F3A7F04C CRC64;
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Pither-Joyce M.D., McCallum J.A.;
"Isolation of an ATP-sulfurylase CDNA clone from Allium cepa.";
Submitted (DEC-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AR212184; ARF18998 1... -
InterPro; IPR002650; ATP-sulfurylase.
Pf01747; ATP-sulfurylase.
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                                                                                                                                Length 424;
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Probom: PD002381; ATP-sulfurlase; 1.
TIGRFAMS; TIGR00339; sopt; 1.
Nucleotidyltransferase; Transferase.
SEQUENCE 424 AA; 47519 MW; E82A27DC11350ABC CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last sequence update)
Last annotation update)
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Last annotation update)
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                                                                                                                           Score 22; DB 10; 1; Pred. No. 1.1e-14;
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                                                                                                                                                                                Mismatches
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Pred. No.
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                                                                                                                                                                                                                             401 NADAVFAFQLRNPVHNGHALLM 422
                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                       200 NADAVFAFQLRNPVHNGHALLM 221
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                                                                                                                                3.00,
100.0%; Pic
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Local Similarity 100.0%;
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                                                                                                                                                                                Conservative
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Gaps

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Length 463;

DB 10; L 1.2e-14;

Mismatches

422

9A45FAA5133A17FF CRC64;

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01-MAY-2000 (TrEMBLrel. 13, Created)
01-MAY-2000 (TrEMBLrel. 13, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
ATP sulfurylase (EC 27.7.4).
Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
eurosids II; Erassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Asteridae; euasterids I; Solanales; Solanaceae; Solanum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
STRIN-CV. COLUMBIA;
X MEDLINE-2026747; PubMed-10806350;
X Hatzfeld Y., Lee S., Lee M., Leustek T., Saito K.;
Hatzfeld Y., Lee S., Lee M., Leustek T., Saito K.;
I sulfurylase isoform from Arabidopsis thaliana.";
Gene 248:51-58(2000).
R EMBL; AF198964; AAF19185.1;
R InterPro; IPR026563 ATP-sulfurylase.
R Promon; PP07747; ATP-sulfurylase.
R Promon; PT07747; ATP-sulfurylase.
R Promon; PT07747; ATP-sulfurylase; I.
R TIGKFAMS; TIGR00339; sopT: 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Klonus D., Hoefgen R., Willmitzer L., Riesmeier J.W.;
"Isolation and characterization of two cDNAclones encoding ATP-
sulfurylase from Potato by complementation of a yeast mutant.";
Plant J. 6:105-112(1994).
EMBL; X79053; CAA55655.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3.6%; Score 22; DB 10; Length 463; 100.0%; Pred. No. 1.2e-14; ive 0; Mismatches 0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ltransferase; Transferase.
463 AA; 51444 MW; 18EC241A3B46CB3D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Last sequence update)
Last annotation update)
(EC 2.7.7.4).
                                            Score 22;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro; IPR002650; ATP-sulfurylase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Created)
                                                                                                                                                    239 NADAVFAFQLRNPVHNGHALLM 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   239 NADAVFAFQLRNPVHNGHALLM 260
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                   PRT;
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MEDLINE-95004649; PubMed-7920699;
                          3.6%; Sco.
100.0%; Pre
0;
                                                                                                                              401 NADAVFAFOLRNPVHNGHALLM
  51372 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-NOV-1996 (TrEMBLrel. 01, 01-NOV-1996 (TrEMBLrel. 01, 01-JUN-2002 (TrEMBLrel. 21, Sulfate adenylyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Solanum tuberosum (Potato).
                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 22; Conservative
                                                                                                                                                                                                                                                                                PRELIMINARY;
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463 AA;
                                            Query Match
Best Local Similarity
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NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=4113
                                                                                      22;
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  SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-NOV-1996 (TrEMBLrel. 21, Last sequence update)
ATP SULÉNTYLASE Precursor (EC 2.7.7.4).
Arabidopsis thaliana (Mouse-ear cress).
Bukaryota: Viridiplantae; Streptophyta; Eukaryophyta; Tracheophyta;
Spermatophyta: Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Glycine max (Soybean).

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
eurosids I; Fabales; Fabaceae; Papilionoideae; Phaseoleae; Glycine.
                                                                                                                              Gaps
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TRANSIT 1 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ;
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                                                                                  Length 461;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted (NOV-2001) to the EMBL/GenBank/DDBJ databases.
EMBL, AF452454; AAL74418.1; -- SEQUENCE 461 AA; 51700 MW; 3504272C93923100 CRC64;
                                       04083BE879CBDE71 CRC64;
                                                                                                                                                                                                                                                                                                                                                       01-JUN-2002 (TrEMBLrel. 21, Created)
01-JUN-2002 (TrEMBLrel. 21, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
                                                                                  DB 10; L
1.2e-14;
                                                                                                                            0;
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Pred. No. 1.2e-14;
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100.0%; Pred. No. ...
0; Mismatches
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ProDom; PD002381; ATP-sulfurylase; 1.
TIGRFAMs; TIGR00339; sopT; 1.
  ProDom; PD002381; ATP-sulfurylase; 1.
                                                                                                                                                                 401 NADAVFAFQLRNPVHNGHALLM 422
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                 TIGREAMS; TIGRO0339; SOPT; 1. SEQUENCE 461 AA; 51807 MW;
                                                           Query Match
Best Local Similarity 100...
Ass 22; Conservative
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                                       SEQUENCE
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Gaps

; 0

463 AA.

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DR Pfam: PF01747; ATP-sulfurylase; 1.

DR ProDom; PD002381; ATP-sulfurylase; 1.

DR TIGRRAMS; TIGR00339; sopT; 1.

KW Nucleotidyltranisferase; Transferase.

SQ SEQUENCE 463 AA; 51827 MW; 2E6CBC1CLD1263A3 CRC64;

Query Match

3.68; Score 22; DB 10; Length 463;

Best Local Similarity 100.0%; Pred. No. 1.2e-14;

Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
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Qy Dp Search completed: May 30, 2003, 12:32:18 Job time : 89 secs

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GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
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ein sea ay 30, s-09-89 271 MSGIKK	OM protein - protein search, using sw model	May 30, 2003, 12:08:55; Search time 73 Seconds (without alignments) 1122.591 Million cell updates/sec	US-09-898-165B-7 3271 1 MSGIKKQKTENQQKSTNVVYMAPKAWKVLTDYYRSEMDKN 615
	ein searc	ay 30, 20	US-09-898-165B-7 3271 1 MSGIKKQKTENQQK

Scoring table: BLOSUM62 Gapop 10.0 , Gapext 0.5 Total number of hits satisfying chosen parameters: 908470

908470 seqs, 133250620 residues

Searched:

Minimum DB seq length: 0
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

A\_Geneseq\_101002:\*

| SIDS2/gcddta/geneseq/geneseqp-embl/AA1980.DAT:\*
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/SIDS2/gcgdata/geneseg/genesegp-embl/AA1997/SIDS2/gcgdata/geneseg/genesegp-embl/AA1997

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

		% Query	• •			
•	Score	Match	e Match Length DB ]	DB	ID	Description
	3216	98.3	619	21		Human transferase
(T)	1162.5			22	AAU32438	Novel human secret
	2602			19	AAW70494	Human disease rela
	2602			20	AAY22349	Human APS kinase/P
	2602			20	AAW67882	Human secreted pro
(4	2031.5	62.1	635	22	ABB71650	Drosophila melanog
	1294		•	21	AAG44040	Arabidopsis thalia
	1294			21	AAG44039	Arabidopsis thalia
	1282			21	AAG30254	Arabidopsis thalia
	1282			21	AAG30253	Arabidopsis thalia

13	Arabidopsis thalia Arabidopsis thalia	Ø	s thal	s thal	thal	thal	thal	Arabidopsis thalia	thal	Arabidopsis thalia	Soybean Adenylylsu	Wheat Adenylylsulp	· Arabidopsis thalia	A. thaliana enviro	Corn Adenylylsulph	Corn Adenylylsulph	Staphylococcus epi	a coli	s thal	oidopsis thal	s thal	idopsis thal	ß	is thal	s thal	s thal	is	sidobic	is thal	o,	Arabidopsis thal	−	
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510	476	408	469	396	373	446	382	373	174	166	311	246	293	293	224	343	204	201	236	251	251	259	263	263	272	276	276	208	140	252	252	305	
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## ALIGNMENTS

											disorder;	ammation;								4-											
									mour; cancer;	ntal disorder;	genetic disorder; neurological disorder; reproductive disorder;	smooth muscle disorder; immunological disorder; inflammation	diagnosis; therapy; ATP sulfurylase/APS kinase 2.						/note= "potential O-phosphorylation"		<pre>/note= "potential O-phosphorylation"</pre>		"potential O-phosphorylation"		O-phosphorylation"		"potential O-phosphorylation"		"potential O-phosphorylation"		"potential O-phosphorylation"
	ein; 619 AA.				ίγ)		3-6.		Transferase; TRNSFS-6; human; antitumour;	gastrointestinal disorder; developmental	logical disore	immunologica	sulfurylase/				Location/Qualifiers		potential 0-		"potential 0-1		"potential 0-p		"potential 0-p		"potential 0-p		"potential 0-1		"potential 0-1
	standard; Protein;				(first entry)		rase TRNSF		TRNSFS-6;	nal disorde	der; neuro	disorder;	erapy; ATP				Location		/note=		/note=		e H	198	/note=	250	e.	285	/note=	308	/note=
RESULT 1 AAY79214	79214		AAY79214;		19-JUN-2000		Human transferase TRNSFS-6.		Transferase;	gastrointesti	genetic disor	smooth muscle	diagnosis; th		Homo sapiens.		Key	Modified-site		Modified-site		Modified-site		Modified-site		Modified-site		Modified-site	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Modified-Sire	
RESULT 1	a	XX	AC	XX	DT	XX	DE	XX	ΚM	ΚW	ΚW	ΚW	ΚM	XX	SO	XX	FН	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT		FT

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NGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKS 475
                                                                                                                                                                                                                                                                    FISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDS
                                                                                                                                                                       DYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVRAE
                                                                                                           AETLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLD-----DGVINMS
                                                                                                                                                            IPIVLPVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPH
                                                                                                                                                                                                         IKMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVH
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU32438 standard; Protein; 648 AA
                                                                                                                                                                                                                                                                                                                                                                                                                   MAPKAWKVLTDYYRSEMDKN 615
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The present sequence is that of human transferase TRNSFS-6, 1 of 15 claimed novel human transferase proteins of the invention (see AAY19209-23). The sequence was deduced from a cDNA clone (see AAX19209-23). The sequence was deduced from a cDNA clone (see CAE AAZ94206) isolated from a foctal kidney library. It shows homology con human ATP sulfurylase/APS kinase 2. TRNSFS-6 is expressed in cardiovascular, gastrointestinal, reproductive and endocrine tissues, especially those associated with cancer, inflammation and classified to the used in the diagnosis, prevention and treatment of cancer, developmental disorders, gastrointestinal disorders, genetic disorders, immunological disorders, neurological disorders, and smooth muscale disorders. The reproductive disorders, and smooth muscale disorders. The polypeptides can also be used to raise antibodies, and to screen for agonists and antagonists of transferase activity.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Human transferase proteins useful for preventing, diagnosing and treating cancers and developmental, gastrointestinal, genetic, immunological, neurological, reproductive and smooth muscle disorders
                                                                                                                                                                                                                                                                                                                                                                                                     Yue H;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 619;
                                                                                                                                                                                                       /note= "potential N-glycosylation"
49..56
/note= "ATP/GTP binding site (P-loop)"
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                                    'note= "potential O-phosphorylation"
            "potential O-phosphorylation"
                                                           "potential O-phosphorylation"
                                                                                  'note= "potential O-phosphorylation"
                                                                                                          note= "potential O-phosphorylation"
                                                                                                                                  "potential O-phosphorylation"
                                                                                                                                                         note= "potential O-phosphorylation"
                                                                                                                                                                                 'note= "potential N-glycosylation"
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Pred. No. 2.5e-316;
2; Mismatches 2;
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                                                                                                                                                                                                                                                                                                                                                                                                     Guegler KJ,
                                                                                                                                                                                                                                                                                                                             98US-0150657.
98US-0186779.
99US-0133642.
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/note=
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439
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Hillman JL, Azimzai Y;
                                                            note=
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N-PSDB; AAZ94206.
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Best Local Similarity
Matches 610; Conserv
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04-NOV-1998;
11-MAY-1999;
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Matches
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Nucleic acids encoding a range of human polypeptides, useful in genetic vaccination, testing and therapy ^{\circ}
                                                             Human; vaccination; gene therapy; nutritional supplement; stem cell proliferation; haematopoiesis; nerve tissue regeneration; immune suppression; immune stimulation; anti-inflammatory; leukaemia.
Novel human secreted protein #2929.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 20; Page 613; 765pp; English.
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2001US-0770160
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61 ALEEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITS 120

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Indels

Conservative

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1 MSGIKKQKTENQQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISF  Human disease related nucleotide kinase-2; DRNK-2; deoxyguanosine kinase;

p21ras; cell proliferation; oncogenesis; cancer; PAPS; immune disorder; neurological dysfunction; gene therapy; adenosine 3'-phosphate 5'-phosphosulfate-dependent enzyme ATP pyrophosphatase PP-motif.

Jocation/Qualifiers

Homo sapiens

Human disease related nucleotide kinase-2 (DRNK-2) protein sequence

(first entry)

29-DEC-1998

AAW70494;

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLD 472
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---- DGVINMS 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The invention relates to novel human secreted polypeptides. The polypeptides and antibodies to the polypeptides are useful for determining the presence of or predisposition to a disease associated with altered levels of polypeptide. The polypeptides are also useful for identifying agents (agonists and antagonists) that bind to them. Cells expressing the proteins are useful for identifying a therapeutic agent for use in treatment of a pathology related to aberrant expression or physiological interactions of the polypeptide. Vectors comprising the nucleic acids encoding the polypeptides and cells genetically engineered to express them are also useful for producing the proteins. The proteins are useful in genetic vaccination, testing and therapy, and can be used as nutritional supplements. They may be used to increase stem cell proliferation; to regulate hemalopiesis; and in
                                                                                                                                                                                                                                                                                                                                                                                                   86
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                                                                                                                                                                                                                                                                                                                                                                                       GKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTRMRKLAREGENPP
                                                                                                                                                                                                                                                                                                                                                                       1 MSGIKKQKTENQQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHG
                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                        bone, cartilage, tendon and/or nerve tissue growth or regeneration; immune suppression and/or stimulation; as anti-inflammatory agents; a in treatment of leukaemias AMI29510-AAU33304 represent the amino aci sequences of novel human secreted proteins of the invention.
                                                                                                                                                                                                                                                                                                               22; Length 648;
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                                                                                                                                                                                                                                                                                                             Score 3162.5; DB 2 Pred. No. 7.1e-311;
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llarity 97.3%;
Conservative
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Best Local 9
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library (LUNGNOT 12). The DNRR-2 DNR sequence is useful for the production of the corresponding recombinant enzyme. The invention production of the corresponding recombinant enzyme. The invention provides DNR enzymes, which are deoxyguanosine kinases, which catalyse the transfer of a terminal phosphate from adenosine triphosphate (ATP) or quanion triphosphate (ATP) or quanion triphosphate (ATP) or cultural levels of GTP and its corresponding nucleoside triphosphate. As GTP levels are known to control the activity of certain oncogenic proteins e.g. p21ras, a protein involved in cell proliferation and concogenesis, suppression of the enzyme activity causes high ratios of GTP:GDP, promoting oncogenesis. Therefore, diseases (e.g. cancers, immune disorders and neurological dysfunction) related to this lack of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  activity may be prevented or treated with the recombinant enzyme, or by gene therapy based strategies. Anti-sense constructs of the DNKR encoding nucleic acids may also be used for inhibition of over-expression
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The present sequence represents a human disease related nucleotide kinase-2 (DRNK-2) protein sequence. The DNKR-2 encoding DNA sequence was first identified in Incyte Clone 373887 from the lung tissue CDNA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nucleic acids encoding de:oxy:guanosine kinase - useful for recombinant production of the enzyme for treating diseases caused lack of the enzyme e.g. cancers caused through loss of enzyme
                                                                                                                                                                                                                                                                                                              "adenosine 3'-phosphate 5'-phosphosulfate (PAPS)-dependent enzyme motif"
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                                                                                                                                                                                                                                                                                "ATP/GTP binding site (p-loop)"
                                                                                                                                                                                                                                                                                                                                                                                        "ATP pyrophosphatase PP-motif"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 2602; DB 19;
Pred. No. 4.2e-254;
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                                                                                                                                                                                                                                                       'note= "N-glycosylated"
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77.1%;
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AA.

AAW70494 standard; Protein; 624

RESULT 3 AAW70494 ID AAW7

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                                                         SFALEEY LVSHA I PCY SLDGDNVRHGLNRNLGF SPGDREEN I RRIAEVAKLFADAGLVCI
                                                                                TSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGI
                                                                                         VLPVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKM
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               5 KKQKTEN-----QQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTI
 Gaps
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 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APS kinase/ATP sulphurylase; human; PAPS production; 3'-phosphosulphate.
67;
Mismatches
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(HUMA-) ZH HUMAN SCI SHINKO ZAIDAN.
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67;
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KAWTVLTEYYKS 620
 Conservative
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TSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGI 178
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                                                                                                                                                                                                                                                                                                                        KKVKLSNNAQNWGMQRATNVTYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTV
                                                                                                                                                                                                                                                                SFALEEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCI
                                                                                                                                                                                                                                                                                                                                                         DSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                VLPVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKM
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                                                                                               This sequence is the human-derived APS kinase/ATP sulphurylase of the invention. The enzyme may be used to prepare 3'-phosphoadenosine 5'-phosphosulphate (PAPS) on a large scale.
                                                                                                                                                                                              Gaps
                                New human-derived APS kinase/ATP sulfurylase gene - useful for large scale preparation of 3'-phosphoadenosine 5'-phosphosulfate
                                                                                                                                                                                              9
                                                                                                                                                                     Length 624;
                                                                                                                                                                                              Indels
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                                                                                                                                                                     Score 2602; DB 20;
Pred. No. 4.2e-254;
7; Mismatches 67;
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                                                                            Claim 1; Page 6-7; 9pp; Japanese.
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                                                                                                                                                                                            67;
                                                                                                                                                                     79.58;
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WPI; 1999-451549/38.
N-PSDB; AAX84897.
                                                                                                                                                                                 al Similarity
472; Conserv
                                                                                                                                                 624 AA;
                                                                                                                                                 Sequence
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Best Local
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Gaps

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New isolated human genes and the secreted polypeptides they enco
useful for diagnosis and treatment of e.g. cancers, neurological
disorders, immune diseases, inflammation or blood disorders
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Hu JS, Lafleur DW, Moore PA,
tuben SM, Shi Y, Young P;
                                                                                                                                                                                                                                                                                                                                                                                                   Claim 11; Page 313-315; 385pp; English.
                                                                               Location/Qualifiers
                                                                                             /label= unknown
                                                                                                                                                                                                                                                                                                            (HUMA-) HUMAN GENOME SCI INC.
                                                                                                                                                                       97US-0041281
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N-PSDB; AAX00686.
                                                                                      Misc-difference
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Greene JM,
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DSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVR 238
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                                                                                                                                                                                                      9 KKVKLSNNAQNWGMQRATNVTYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTV
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                                                                                                                                                                  5 KKOKTEN-----QOKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTI
                                                                                                                                                                                     Drosophila; developmental biology; cell signalling; insecticide;
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                                                                               Length 625;
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                                                                                                                      67;
                                                                             79.5%; Score 2602; DB 20; 77.1%; Pred. No. 4.2e-254; ive 67; Mismatches 67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ABB71650 standard; Protein; 635 AA.
(see AAX00611 for described uses).
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                                                                                                   Best Local Similarity 77.1 Matches 472; Conservative
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                                           625 AA;
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The invention relates to 87 movel genes and their fragments (nucleic acid sequences: AAX00611-X00724; amino acid sequences AAW67807-W68004) which are useful for preventing, treating or ameliorating medical conditions e.g. by protein or gene therapy. Also, pathological conditions can be diagnosed by determining the amount of the new polypeptides in a sample or by determining the presence of mutations in the new polynucleotides. Specific uses are described for each of the 87 polynucleotides, based on which tissues they are most highly expressed in
                   Human; secreted protein; fusion protein; gene therapy; protein therapy; diagnosis; tissue; cancer; tumour; neurodegenerative disorder; leukaemia; developmental abnormality; foctal deficiency; blood; allergy; renal; immune system; asthma; lymphocytic disease; brain; hepatic; lymphoma; inflammation; ischemic shock; Alzheimer's disease; restenosis; AIDS; cognitive disorder; schizophrenia; prostate; obesity; osteoclast; thymus; osteoporosis; arthritis; testis; lung; thyroiditis; thyroid; digestion;
                                                                                                                                                                  endocrine; metabolism; regulation; malabsorption; gastritis; neoplasm
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Ni J, Olse
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Thu Jun

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sequences (ABL01840-ABL16175) and the encoded proteins (ABB7737-ABB72072).

(ABB57737-ABB72072).

(ABB57737-ABB72072).

Specification, but was obtained in electronic format directly from WIPO at ftp.wipo.int/pub/published_pct_sequences.
                                                                                                                     Disclosure; SEQ ID NO 41742; 21pp + Sequence Listing; English.
                                                Myers EW;
                                               PWD,
       23-MAR-2000; 2000US-191637P.
11-JUL-2000; 2000US-0614150.
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                                                                                      New isolated nucleic acid
genes from Drosophila and
interactions
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Matches. 387; Conservative
                                               Li
                                               Adams M,
                                                              WPI; 2001-656860/75.
N-PSDB; ABL15753.
                               (PEKE ) PE CORP NY
                                                                                                                                                                                                                                   635 AA;
                                               Venter JC,
                                                                                                                                                                                                                                    Sequence
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562 GLDSMEILPFRVAAYDKSASRMAFFEPKRKDEFEFISGTKMRTLAKTGASPPDGFMEPEA 621
                                                                                                                                                                                                                                                        Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                                                                                            Arabidopsis thaliana protein fragment SEQ ID NO: 55116
                                                                                                                                 AAG44040 standard; Protein; 460 AA
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9905-0130077-
9905-0130049-
9905-0130891-
9905-0131449-
9905-0132407-
9905-0132485-
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9905-0132863-
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99US-0123180.
99US-0123548.
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99US-0128234.
99US-0128714.
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                                                                                                                                                                                              (first entry)
                            601 WKVLTDYYRS 610
                                                                                                                                                                                                                                                                                       termination sequence
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                                                         622 WRILATYYON
                                                                                                                                                                                                                                                                                                                                             EP1033405-A2
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29-MAR-1999;
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16-JUN-1999
                                                                                                                                                                AAG44040;
                                                                                                     RESULT 7
                                                                                                                     AAG44040
                            Óγ
                                                                                                                                                                The invention relates to an isolated nucleic acid detection reagent capable of detecting 1000 or more genes from Drosophila. The invention is useful in developmental biology and in elucidating cell signalling and cell-cell interactions in higher eukaryotes for the development of insecticides, therapeutics and pharmaceutical drugs. The invention discloses genomic DNA sequences (ABL16176-ABL30511), expressed DNA sequences (ABL016175) and the encoded proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRENA 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETPERVL 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     193 KTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIH---ELFVPEN-KLDHVRAEAETLPSLS 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  203 NTHGYTVRESTOKLVTLLEQEGIIPRS-LRDVDLLPELYPSESIATEALRHEAESLQAIE 261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               249 ITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLD--DGVI--NMSIPIVLPVSA 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                305 EDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKMVMESGD 364
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13 QKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSHAIP 72
                                                                                                                                                               detection reagent for detecting 1000 or more for elucidating cell signalling and cell-cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TRROLLERGFKOPVLLLHPLGGWTKDDDVPLDVRMKQHQAVLDAGVLRREDTVLAIFPSP
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63.4%; Pred. No. 2.8e-196;
ive 94; Mismatches 116; Indels
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		4; 285 116 342
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	•	99; 9905-0161920. 99; 9905-0161992. 99; 9905-0161993. 99; 9905-0162142. 39.6%; Score 1294; DB 21; Length 460; imilarity 62.2%; Pred. No. 8.8e-122; Conservative 61; Mismatches 82; Indels 4; Gaps ELEVPENKLDHVRAEAETLESLITKLDLOWVOVLSEGWATPLKGEMREKEYLOVMHFDT
		4; XLQV::   ::   FFLQT
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		DB 21; 3.8e-122; nes 82; vvQvLSEGWP wMYVLSEGWP 1:
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                                                                                                                                                                                                                                         343 SRVWGTTCTKHPHI-KMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMN
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                                                                         39.6%; Score 1294; DB 21;
ilarity 62.2%; Pred. No. 8.9e-122;
Conservative 61; Mismatches 82;
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05 - MAR - 1999;

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23-JUN-1999
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                                                                                                                                                                                                                                                                                               342 CSRVWGTICIKHPHI-KMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEM 400
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                                                                                                                                                                                                                   Query Match 39.2%; Score 1282; DB 21; Best Local Similarity 62.3%; Pred. No. 1.5e-120; Matches 243; Conservative 60; Mismatches 81;
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99US-0159637.
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226 ELFVPENKLDHVRAEAETLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDT 285 342 CSRVWGTTCTKHPHI-KMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEM 400 461 QHAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHP 521 ETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTR Gaps ; 9 Length 465; Indels 39.2%; Score 1282; DB 21; 62.3%; Pred. No. 1.5e-120; live 60; Mismatches 81; 581 MRKLAREGENPPDGFMAPKAWKVLTDYYRS 610 99US - 0154039. 99US - 0154779. 99US - 0155139. 99US - 0155486. 99US - 0156458. 99US - 0156458. 99US - 0157753. 99US - 0157753. 99US - 0157753. 9905-0159294. 9905-0159294. 9905-0159295. 9905-0159330. 9905-0159330. 99US-0161992. 99US-0161993. 99US-0162142. 99US-0159638 99US-0160741 99US-0160767 99US-0160815 99US-0160980 243; Conservative Similarity SEP-1999 SEP-1999 SEP-1999 SEP-1999 OCT-1999 OCT-1999; ocal

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99US-0139457.
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99US-0139460.
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  Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter; termination sequence.
                                                                    Arabidopsis thaliana protein fragment SEQ ID NO: 36134.
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99US-0128714.
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345
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                                                                                                     521 ETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTR 580
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                                                                                                                                                                                                                                                                                                           Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                              286 GADAVFAFQLRNPVHNGHALLMIDTRRRLLEMGYKNPILLLHPLGGFTKADDVPLSWRWK
                                                                        401 NADAVFAFQLRNPVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMK
                                                             461 QHAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHP
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                                                                                                                                                          AAG09595 standard; Protein; 473 AA.
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99US-0135629
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990S-0136021. 990S-0136392. 990S-0136782. 990S-0137222. 990S-0137528.	990S-0138540 990S-0138540 990S-0138847 990S-0139119	99US-0139453. 99US-0139454. 99US-0139455. 99US-0139456. 99US-0139456. 99US-0139457.	990S-0139460. 990S-0139461. 990S-0139462. 990S-0139450. 990S-0139750. 990S-0139817. 990S-0139899.	99US-0140354. 99US-0140695. 99US-0140823. 99US-0140991. 99US-0141287. 99US-0141154. 99US-0142055.	990S-0142803 99US-0142803 99US-0142970 99US-0143624 99US-0144008 99US-0144086 99US-0144325	990S-0144332 990S-0144333 990S-0144334 990S-0144352 990S-0144682 990S-0144884 990S-0144884 990S-0144884 990S-0145086	99US - 0145089 99US - 0145192 99US - 0145192 99US - 0145218 99US - 0145284 99US - 0145289 99US - 0145918 99US - 0145918 99US - 0145918 99US - 0145918 99US - 0146918
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19-JUL-1999;
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                                                                                                                                                                                                                                                                                  LQWVQVLSEGWATPLKGFMREKEYLQVMHFDTL-LDDGV-INMSIPIVLPVSAEDKTRLE 311
                                                                                                                                                                                                                                                                                                                99 LEWVHVISEGWASPLKGFWREDEYLQSLHFNSLRLKNGTFVNMSLPIVLAIDDDTKEQI- 157
                                                                                                                                                                                                                                                                                                                                                                                     GCSKFV--LAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHI-KMVMESGDWLVG 368
                                                                                                                                                                                                                                                                                                                                                                                                                LLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYA 488
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                                                                                                                                                                                                             39 LNLVYKRNLTMQSVSKMTVKSSLIDPDGGELVELIVPETEIGVKKAESETMPKVKLNQID 98
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                                                                        DB 21;
                                                                        38.9%; Score 1272.5; DB 21
57.0%; Pred. No. 1.4e-119;
tive 72; Mismatches 92;
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99US-0123180.
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99US-0127462
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                                                                                                                             Matches 243; Conservative
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                                                                        Query Match
Best Local Similarity
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28-OCT-1999;
29-OCT-1999;
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29-MAR-1999
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                                                                                                                                                                                                38.9%; Score 1272.5; DB 21 57.0%; Pred. No. 1.4e-119; ive 72; Mismatches 92;
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99US-0161993.
99US-0162142.
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99US-0147192.
99US-0144352,
99US-0144632,
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99US-0144814.
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termination sequence
                    Arabidopsis thaliana
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                                         EP1033405-A2
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Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter; termination sequence.
                                                                                                                                                                                    Arabidopsis thaliana protein fragment SEQ ID NO: 54606.
578 GTRMRKLAREGENPPDGFMAPKAWKVLTDYYRSEMDK
              379 GTKMRTYARTGENPPDGFMCPSGWNVLVKYYESLOEK
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60.5%; Pred. No. 2.1e-119;
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Patent No.
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GenCore version 5.1.6
(c) 1993 - 2003 Compugen Ltd
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Maximum Match 1008
Listing first 45 summaries
                                                                            protein search, using sw model
                                                                                                                                                                                                                                                                               BLOSUM62
Gapop 10.0 , Gapext 0.5
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length: 2000000000
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3271
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                Copyright
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Match
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2367
1274
1268.5
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1237.5
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481
442.5
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Perfect score:
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198
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Maximum DB :
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#### VET C NMEN

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US-08-879-561-3

Sequence 3, Application US/08879561

Sequence 3, Application US/08879561

Sequence 3, Application US/08879561

SERENTAL INFORMATION:

APPLICANT: Bandman, Jennifer L.

APPLICANT: Guedler, Karl J.

APPLICANT: Corley, Philip R.

APPLICANT: Corley, Neil C.

TITLE OF INVENTON: DISEASE RELATED NUCLEOTIDE KINASES

NUMBER OF SEQUENCES: 12

CORRESPONDENCES: 12

CORRESPONDENCESS:

ADDRESSEE: Incyte Pharmaceuticals, Inc.

STREET: 3174 Porter Drive

CITY: Palo Alto

STREET: 3174 Porter Drive

CITY: Palo Alto

STREET: DAIO AND COMPATION:

MEDIUM TYPE: Diskette

COMPUTER: TBM COMPATION: 424

COMPUTER: TBM COMPATION: 424

PRICKASIFICATION NUMBER: US/08/879,561

FILING DATE: Herewith A24

PRICK APPLICATION NUMBER: US/08/879,561

FILING DATE: HEREWITON: A24

PRICK BATING STERN: NUMBER: BF-0325 US

TELECOMUNICATION NUMBER: BF-0325 US

TELECOMUNICATION NUMBER: BF-0325

TELECOMUNICATION NUMBER: BF-0355

TELECOMUNI
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TSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGI 178
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Pred. No. 1.3e-268;
66; Mismatches 69;
                  US/08/879,561
                                                                                                                          NAME: Billings, Lucy J.
REGISTRATION NUMBER: 36,749
REFERENCE/DOCKET NUMBER: PF-
TELECOMMUNICATION INFORMATION:
TELEPHONE: 415-855-0555
TELEFAX: 415-845-4166
                                                                                                                                                                                                                                                                                                                                                                                                         79.5%;
                                                                                                            ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                 INFORMATION FOR SEQ ID NO: 9
SEQUENCE CHARACTERISTICS:
LENGTH: 624 amino acids
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Best Local Similarity 77.0
Matches 471; Conservative
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609 KAWTVLVEYYKS 620
 CURRENT APPLICATION DATA:
                               Herewith
                                                                                                                                                                                                                                                                                   TYPE: amino acid
STRANDEDNESS: single
                                             CLASSIFICATION: 424
PRIOR APPLICATION DATA:
APPLICATION NUMBER:
FILING DATE:
                   APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                              TOPOLOGY: linear
IMMEDIATE SOURCE:
LIBRARY: GenBank
CLONE: 1109676
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                                                                                                                                                                                                                                                                    SFALEEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCI
                                                                                                                                                                                       TSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGI
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9
Length 624;
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Sequence 9, Application US/08879561

Patent No. 587482

GENERAL INFORMATION:

APPLICANT: Bandman, Jennifer L.

APPLICANT: Hawkins, Phillip R.

APPLICANT: Guegler, Karl J.

APPLICANT: Guegler, Karl J.

APPLICANT: Graffy, Neil C.

TITLE OF INVENTION: DISEASE RELATED NUCLEOTIDE KINASES
 Score 2602; DB 2;
Pred. No. 6.1e-269;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SYSTEM: DOS
FastSEQ for Windows Version 2.0
                Pred. No. 6.1e; Mismatches
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3174 Porter Drive
                             67;
79.58;
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IBM Compatible
                                Conservative
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OPERATING SYSTEM:
SOFTWARE: FASTSEQ
              Best_Local Similarity
Matches 472; Conserv
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 Query Match
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ERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYAGP 490
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                                                                                                                                                                                                                                                                                       486 TEVQWHAKARMSTGANFYIVGRDPAGMPHPETKQDLYNATHGAKVLTMAPGLTQLEIVVF 545
                                                                                                                                                                                                                                                                                                                         RVAAYNKAKKAMDFYDPARHNEFDFISGTRMRKLAREGENPPDGFMAPKAWKVLTDYYRS 610
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                                                                                                                                       APPLICANT: Allen, Steve
APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
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61.4%; Pred. No. 3.2e-127;
Live 60; Mismatches 86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION NUMBER: US/09/346,408B CURRENT FILING DATE: 1999-07-01 EARLIER APPLICATION NUMBER: 60/092,833 EARLIER FILING DATE: July 14, 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 11, Application US/09346408B Patent No. 6338966
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: Microsoft Office 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM: Solanum tuberosum
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Matches 239; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                           611 EMDKN 615
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US-09-346-408-11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       251 KLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLDDGVINMSIPIVLPVSAEDKTRL 310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             71 IPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRE 130
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NQQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               191 VLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVRAEAETLPSLSIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                APPLICANT: Hawkins, Phillip R.
APPLICANT: Guegler, Karl J.
APPLICANT: COLIEY, Neil C.
TITLE OF INVENTION: DISEASE RELATED NUCLEOTIDE KINASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        72.4%; Score 2367; DB 2; 71.4%; Pred. No. 7.7e-244; ive 69; Mismatches 104;
                                                                                                                                                                                                                                                                                                                                                                                                                           FastSEQ for Windows Version 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PF-0325 US
                                                                                                                                                                                                                                                     1: Incyte Pharmaceuticals,
3174 Porter Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                           LICATION NUMBER: US/08/879,561 ING DATE: Herewith
                                                              Sequence 10, Application US/08879561
Patent No. 5817482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NAME: Billings, Lucy J.
REGISTRATION NUMBER: 36,749
REFERENCE/POCKET NUMBER: PF-CTELECOMMUNICATION INFORMATION:
TELEPHONE: 415-855-0555
TELEPAS: 415-845-4166
                                                                                                                                   Hillman, Jennifer L
Hawkins, Phillip R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INFORMATION FOR SEQ ID NO: 10:
                                                                                                                                                                                                                                                                                                                                                                                         IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
LENGTH: 610 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 72.49
Best Local Similarity 71.49
Matches 432; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                           Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION: 424
APPLICATION NUMBER:
FILLING NAME
                                                                                                                                                                                                                NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
ADDRESSEE: Incyte Ph
                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
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CLONE: 705385
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                                                                                                                                                                                                                                                                                                                                                                                                           OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                     Palo Alto
                                                                                                 GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                       USA
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TOPOLOGY: lin
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                                                                                                                                                                                                                                                                                                                                                                           MEDIUM TYPE:
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                                                                                                                                                                                                                                                                                                                     COUNTRY: US
ZIP: 94304
                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER:
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                                                JS-08-879-561-10
                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE
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Best Local (
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Matches
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                                             207 VELLQEQNIVPYTIIK ------DIHELFVPENKLDHVRAEAETLPSLSITKLD 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LNLVYKRNLTMQSVSKMTVKSSLIDPDGGELVELIVPETEIGVKKAESETMPKVKLNQID 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |||:|| | |::||||| ||||| || :|| GDLEVFEPIKYNDGLDHYRLSPKQLREEFDNRQADAVFAFQLRNPVHNGHALLMNDTRKR 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAPGLTSVEII 548
300 HEMVLEDGVLDPETTVVSIFPSPMHYAGPTEVQWHAKARINAGANFYIVGRDPAGMGHPL 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             254 LQWVQVLSEGWATPLKGFMREKEYLQVMHFDTL-LDDGV-INMSIPIVLPVSAEDKTRLE 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       312 GCSKFV--LAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHI-KMVMESGDWLVG 368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGHALLMQDTCRR 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYA 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PFRVAAYNKAKKAMDFYDPARHNEFDFISGTRMRKLAREGENPPDGFMAPKAWKVLTDYY 608
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                                                                                                                                                                                                                                    APPLICANT: Aller, Steve
APPLICANT: Aller, Steve
APPLICANT: Falder, Carl
APPLICANT: Falder, Carl
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REPERBUCE: BB-1167-4
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: JU17
NUMBER: OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
SEQ ID NO 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 476;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1268.5; DB 4; Pred. No. 1.3e-126; 71; Mismatches 90;
                                                                                    582 RKLAREGENPPDGFMAPKAWKVLTDYYRS 610
                                                                                                        Sequence 12, Application US/09346408B Patent No. 6338966
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; ORGANISM: Arabidopsis thaliana
US-09-346-408-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           38.8%;
57.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity 57.3%
Matches 242; Conservative
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RESULT 6 US-09-346-408-6

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62 ELVVTDFERDLKKGEALSLPRIKLSRIDLEWVHVLSEGWATPLKGFMREAEFLQTLHFNS 121
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              226 ELFVPENKLDHVRAEAETLPSLSITKLDLQWQVLSEGWATPLKGFMREKEYLQVMHFDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               L-LDDG-VINMSIPIVLPVSAEDKTRLEGCSKFVLAHG-GRRVAILRDAEFYEHRKEERC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              402 ADAVFAFQLRNPVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPE
                                                                                                                                                       APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: Juy 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
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APPLICANT: Anderson, Shawn
APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
CURRENT PRILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FLING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 465;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   38.6%; Score 1263; DB 4;
61.7%; Pred. No. 4.8e-126;
iive 59; Mismatches 86;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        582 RKLAREGENPPDGFMAPKAWKVLTDYYRS 610
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; Sequence 4, Application US/09346408B; Patent No. 6338966; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity 61.7 (0) Conservative
                                                                                      APPLICANT: Allen, Steve
APPLICANT: Anderson, Shawn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ) ORGANISM: Glycine max US-09-346-408-6
                             Patent No. 6338966
GENERAL INFORMATION:
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10;

Gaps

51;

Indels

Length 465;

DB 4;

237

37

295

73

193 413

354

473 313 533

253

593

GENERAL INFORMATION:
APPLICANT: Allen, Steve
APPLICANT: Anderson, Shawn

APPLICANT: Falco, Carl
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER PILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97

ORGANISM: Triticum aestivum 461 SEQ ID NO 8 TYPE: PRT LENGTH:

US-09-346-408-8

Query Match

226 ELFVPENKLDHVRAEAETLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDT 285 Gaps Indels 37.5%; Score 1227; DB 4; 59.1%; Pred. No. 3.3e-122; Mismatches 26; Similarity 59.1 30; Conservative 230; Local Best Loca Matches

Length 461

238 298 521 358 581 SRVWGTTCTKHPHI-KMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMN 401 461 HAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPE ADAVFAFQLRNPVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQ TKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTRM LL--DDGVINMSIPIVLPVSAEDKTRLEGCSKFVLA-HGGRRVAILRDAEFYEHRKEERC RKLAREGENPPDGFMAPKAWKVLTDYYRS 610 59 343 179 299 359 286 102 239 462 522 582 419 Ω qq qq g ò Óγ ŏ g ŏ δ ŏ

GENERAL INFORMATION:
APPLICANT: Allen, Steve
APPLICANT: Allen, Shawn
APPLICANT: Falco, Carl
APPLICANT: Falco, Carl
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A US-09-346-408-2; Application US/09346408B; Patent No. 6338966

CURRENT APPLICATION NUMBER: US/09/346,408B CURRENT FILING DATE: 1999-07-01 EARLIER APPLICATION NUMBER: 60/092,833 EARLIER FILLING DATE: July 14, 1998 NUMBER OF SEQ ID NOS: 12 Microsoft Office 97 LENGIH: 133 SOFTWARE: M

. 0 Length 133; Indels 15; ; Score 562; DB 4; ; Pred. No. 4.7e-52; 14; Mismatches 15 17.2%; 78.2%; 104; Conservative Similarity Query Match Best Local 9 Matches

Zea mays

US-09-346-408-2

TYPE: PRT

ORGANISM:

ö 440

Gaps

500 9 LHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSR 61 141 a δλ qq

381 DGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGHALLMQDTCRRLLERGYKHPVLL

δ

513 : ||||||||||||||||| INAGANFYIVGRD 133 MIAGANFYIVGRD 501 121 δy QQ

Sequence 4517, Application US/09134001C Patent No. 6380370 GENERAL INFORMATION: US-09-134-001C-4517 RESULT 10

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296 NYGCTHFIVGRDHAGV-----GDYYGTYEAQELITQFEDELGIQILKFEHAFYCEACGN 349
                                                                                                                                                                    442 HPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRM 501
                                                                                                                                                                                                                                                           502 IAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAY----N 556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           359 VMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGH 418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     382 GLDOYRLTPLELKOKCKEMNADAVFAFQLRNPVHNGHALLMODTCRRLLERGYKHPVLLL
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APPLICANT: Anderson, Shawn
APPLICANT: Anderson, Shawn
APPLICANT: Falco, Carl
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REPERBENCE: BB-1167-A
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63 ALLMTDTRRRLLEMGYKNPVLLLHPLGGFTKADDVPLSVRMKQHEKFL 110
                                                                                                                                                                                                                                                                                                                                                  557 KAKKAMDFYDPARHNEFDFISGTRMRKLAREGENPPDGFMAPKAWKVL 604
                                                                                                                                                                                                                                                                                                                                                                                            350 MATAKTCPHDASOHLH---LSGTKVREKLRNGESLPTKFSRPEVAEVL 394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               419 ALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVL 466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 417; DB 4;
Pred. No. 1.1e-36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION: 186 Human Secreted proteins FILE REFERENCE: PZ002P1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CURRENT FILING DATE: 1998-09-08
CURRENT FILING DATE: 1998-09-08
EARLIER APPLICATION NUMBER: PCT/US98/04493
EARLIER FILING DATE: 1998-03-06
EARLIER FILING DATE: 1997-03-07
EARLIER APPLICATION NUMBER: 60/040,333
EARLIER APPLICATION NUMBER: 60/040,333
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; Sequence 10, Application US/09346408B
; Patent No. 6338966
; GENERAL INFORMATION:
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Patent No. 6420526
GENERAL INFORMATION:
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71.38;
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ORGANISM: Triticum aestivum
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Best Local Similarity
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APPLICANT: Lynn Doucette-Stamm et al TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO STAPHYLOCOCCUS TITLE OF INVENTION: DIDERMIDIS FOR DIAGNOSTICS AND THERAPEUTICS FILE REPERENCE: GTC-007
CURRENT APPLICATION NUMBER: US/09/134,001C
CURRENT APPLICATION NUMBER: US 60/064,964
PRIOR FILING DATE: 1997-11-08
PRIOR FILING DATE: 1997-11-08
PRIOR FILING DATE: 1997-08-14
NUMBER OF SEQ ID NOS: 5674
SEQ ID NO 4517
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APPLICANT: Lynn Doucette-Stamm et al TITLE OF INVENTION: WICKLEIC ACID ANNO ACID SEQUENCES RELATING TO STAPHYLOCOCCUS TITLE OF INVENTION: UPDERMIDIS FOR DIAGNOSTICS AND THERAPEUTICS CURRENT APPLICATION NUMBER: US/09/134,001C
CURRENT APPLICATION NUMBER: US 60/064,964
PRIOR FILING DATE: 1997-11-08
PRIOR FILING DATE: 1997-11-08
PRIOR FILING DATE: 1997-11-08
PRIOR FILING DATE: 1997-11-08
NUMBER OF SEQ ID NOS: 5674
SEQ ID NOS: 5674
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4.5e-43;
ches 73; Indels
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29.9%; Pred. No. 1.9e-38;
iive 82; Mismatches 175;
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; Pred. No. 4.5e-
37; Mismatches
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                                                                                                                                                                                                                                                                                                                     ; ORGANISM: Staphylococcus epidermidis US-09-134-001C-4517
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Best Local Similarity 44.5%
Matches 93; Conservative
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Matches 122; Conserv
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EARLIER FILING DATE: 197-05-23
EARLIER APPLICATION NUMBER: 60/047,585
EARLIER FILING DATE: 1997-05-23
EARLIER APPLICATION NUMBER: 60/047,586
EARLIER FILING DATE: 1907-05-23 FILING DATE: 1997-08-22
APPLICATION NUMBER: 60/056,637
FILING DATE: 1997-08-22
APPLICATION NUMBER: 60/056,903
FILING DATE: 1997-08-22 EARLIER APPLICATION NUMBER: 60/047,593 EARLIER FILING DATE: 1997-05-23 EARLIER APPLICATION NUMBER: 60/047,614 FILING DATE: 1997-06-06 APPLICATION NUMBER: 60/056,886 FILING DATE: 1997-08-22 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,872 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,882 APPLICATION NUMBER: 60/056,879 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,880 FILING DATE: 1997-05-23 APPLICATION NUMBER: 60/047,590 FILING DATE: 1997-05-23 PLICATION NUMBER: 60/043,315 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,893 APPLICATION NUMBER: 60/056,630 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,878 FILING DATE: 1997-08-22 EARLIER APPLICATION NUMBER: 60/056,903 EARLIER FILING DATE: 1997-08-22 EARLIER APPLICATION NUMBER: 60/056,888 EARLIER FILING DATE: 1997-08-22 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,910 APPLICATION NUMBER: 60/056,845 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,892 EARLIER APPLICATION NUMBER: 60/047,599
EARLIER FILING DATE: 1997-05-23
EARLIER APPLICATION NUMBER: 60/047,588
EARLIER FILING DATE: 1997-05-23 TLING DATE: 1997-04-11
APPLICATION NUMBER: 60/048,974 APPLICATION NUMBER: 60/056,877 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,889 APPLICATION NUMBER: 60/056,662 FILING DATE: 1997-08-22
APPLICATION UNMBER: 60/056,894
FILING DATE: 1997-08-22
APPLICATION NUMBER: 60/056,911 APPLICATION NUMBER: 60/056,636 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,874 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,631 FILING DATE: 1997-08-22 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/057,761 APPLICATION NUMBER: 60/047,595 FILING DATE: 1997-05-23 APPLICATION NUMBER: 60/056,864 APPLICATION NUMBER: 60/047,594 ILING DATE: 1997-08-22 FILING DATE: 1997-08-22 ILING DATE: 1997-08-22 ILING DATE: 1997-05-23 ILING DATE: 1997-08-22 EARLIER F EARLIER F EARLIER F EARLIER F EARLIER F EARLIER F BARLIER F
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APPLICATION NUMBER: 60/047,600
FILING DATE: 1997-05-23
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APPLICATION NUMBER: 60/047,633
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PPLICATION NUMBER: 60/047,617
ILING DATE: 1997-05-23
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FILING DATE: 1997-05-23
APPLICATION NUMBER: 60/047,592
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PPLICATION NUMBER: 60/047,587
LING DATE: 1997-05-23
PPLICATION NUMBER: 60/047,492
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APPLICATION NUMBER: 60/047,597
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APPLICATION NUMBER: 60/047,583
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CATION NUMBER: 60/047,598
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FILING DATE: 1997-04-11
APPLICATION NUMBER: 60/043,314
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APPLICATION NUMBER: 60/047,581
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ILING DATE: 1997-05-23
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PPLICATION NUMBER: 60/043,580
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APPLICATION NUMBER: 60/043,669
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FILING DATE: 1997-04-11
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FILING DATE: 1997-05-23
APPLICATION NUMBER: 60/043,578
                                                                                                                                                                                                                                         APPLICATION NUMBER: 60/056,876
FILING DATE: 1997-08-22
APPLICATION NUMBER: 60/056,881
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APPLICATION NUMBER: 60/056,909
FILING DATE: 1997-08-22
                                                         APPLICATION NUMBER: 60/043,576
                                                                       EARLIER FILING DATE: 1997-04-11
EARLIER APPLICATION NUMBER: 60/047,501
EARLIER FILING DATE: 1997-05-23
EARLIER APPLICATION NUMBER: 60/043,670
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APPLICATION NUMBER: 60/061,060
FILING DATE: 1997-10-02
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FILING DATE: 1997-03-07
APPLICATION NUMBER: 60/040,626
                                                                                                                                                                   APPLICATION NUMBER: 60/056,632
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APPLICATION NUMBER: 60/056,664
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R FILING DATE: 1997-08-22

R APPLICATION NUMBER: 60/056,845

R FILING DATE: 1997-08-22

R PILING DATE: 1997-08-22

R FILING DATE: 1997-08-22

R APPLICATION NUMBER: 60/057,761 R PILLING DATE: 1997-08-22

R APPLICATION NUMBER: 60/047,595

R APPLICATION NUMBER: 60/047,599

R PILING DATE: 1997-05-23

R PAPLICATION NUMBER: 60/047,588

R PELLING DATE: 1997-05-23

R PELLING DATE: 1997-05-23

R PILLING DATE: 1997-05-23 LICATION NUMBER: 60/056,630 ING DATE: 1997-08-22 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,662 FILING DATE: 1997-08-22 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,882 FILING DATE: 1997-08-22 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,879 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,880 APPLICATION NUMBER: 60/056,894 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,911 FILING DATE: 1997-08-22 FILING DATE: 1997-08-22
APPLICATION NUMBER: 60/056,910
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ARPLICATION NUMBER: 60/056,864
FILING DATE: 1997-08-22 FILING DATE: 1997-05-23
APPLICATION UNDBER: 60/047,590
APPLICATION UNDBER: 60/047,594
APPLICATION NUMBER: 60/047,594 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,889 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,637 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,888 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,636 FILING DATE: 1997-05-23 APPLICATION NUMBER: 60/047,593 60/043,578 APPLICATION NUMBER: 60/056,886 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,877 FILING DATE: 1997-08-22 APPLICATION NUMBER: 60/056,893 APPLICATION NUMBER: 60/056,878 APPLICATION NUMBER: 60/056,872 APPLICATION NUMBER: 60/056,903 APPLICATION NUMBER: 60/056,874 APPLICATION NUMBER: 60/056,631 APPLICATION NUMBER: 60/047,586 APPLICATION NUMBER: 60/047,589 APPLICATION NUMBER: 60/047,614 60/048,974 FILING DATE: 1997-08-22 FILLING DATE: 1997-05-23 APPLICATION NUMBER: 60/( FILLING DATE: 1997-04-11 1997-08-22 1997-08-22 ILING DATE: 1997-08-22 FILING DATE: 1997-05-23 1997-05-23 EARLIER EARLIER EARLIER EARLIER EARLIER

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RESULT 15

US-08-076-03

Sequence 3, Application US/08038760

Patent No. 5496731

September No. 5496731

TITLE OF INVENTION: Methods for Tumor Suppressor Gene Products and TITLE OF INVENTION: Methods for Tumor Suppressor Gene Therapy.

TITLE OF INVENTION: Methods for Tumor Suppressor Gene Therapy.

TITLE OF INVENTION: Methods for Tumor Suppressor Gene Therapy.

CORRESPONDENCE ADDRESS:

ADDRESSE: Pennie & Edmonds

STATE: New York

COMPUTER: New York

STATE: New York

COMPUTER: IBM PC Compatible

COMPUTER: IBM PC Compatible

COMPUTER: EALENT NEW PC Compatible

COMPUTER: EALENT NEW PC COMPATIBLE

COMPUTER: IBM PC COMPATIBLE

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                                                                                                                                                                                                                                                                                                                             Query Match 3.2%; Score 106; DB 1; Length 816;
Best Local Similarity 18.3%; Pred. No. 0.058;
Matches 139; Conservative 100; Mismatches 224; Indels 296; Gaps
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                                                               7409-025-999
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                 NAME: Poissant, Brian M
REGISTRATION NUMBER: 28,462
REFERENCE/DOCKET NUMBER: 7409-
TELECOMMUNICATION INFORMATION:
TELEFANCE: (212) 869-9741/8864
TELEX: 66141 PENNIE
INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
LENGTH: 816 amino acids
TYPE: AMINO ACID
TOPOLOGY: linear
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ATTORNEY/AGENT INFORMATION:
NAME: Poissant, Brian M
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Search completed: May 30, 2003; 12:21:02 Job time : 29 secs Sednence Sed

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APPLICANT: Chen, Huei-Mei
TITLE OF INVENTION: GENES EXPRESSED IN BREAST CANCER
FILE REFERENCE: PA-0037 P
CURRENT APPLICATION NUMBER: US/09/974,298
CURRENT FILING DATE: 2001-10-04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 3216; DB 9;
Pred. No. 2.5e-281;
2; Mismatches 2;
US-09-984-245-332

US-09-966-262-332

US-09-966-262-333

US-09-984-245-339

US-09-983-966-362-339

US-09-983-966-362-339

US-09-983-966-363-339

US-09-966-262-336

US-09-966-262-336

US-09-966-262-336

US-09-966-262-336

US-09-966-262-338

US-09-966-262-338

US-09-966-262-338

US-09-983-966-333

US-09-983-966-333
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION NUMBER: 60/238,331 PRIOR FILING DATE: 2000-05-10 NUMBER OF SEQ ID NOS: 194 SOFTWARE: PERL PROGRAM
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Best Local Similarity 98.48.
Matches 610; Conservative
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; OTHER INFORMATION: Incy
US-.09-974-298-184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM: Homo sapiens
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                                                                                    May 30, 2003, 12:19:45; Search time 48 Seconds (without alignments) 1296.929 Million cell updates/sec
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1 MSGIKKQKTENQQKSTNVVY......MAPKAWKVLTDYYRSEMDKN 615
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/cgn2_6/ptodata/1/pubpaa/US60_NEW_PUB.pep:*
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             5.1.6
Compugen Ltd
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US-09-741-669-457
US-09-864-761-39981.
US-09-809-391-635
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US-09-966-262-340
US-09-983-966-340
US-10-143-090-340
US-09-809-391-634
US-09-771-161A-153
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US-09-983-966-196
US-10-143-090-196
US-09-771-161A-244
US-11-156-239-40
US-10-199-485-40
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Listing first 45 summaries
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                                                             protein search, using sw model
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                                                APPLICATION NUMBER: US 60/048, 096
BR FILING DATE: 1997-05-30
BR APPLICATION NUMBER: US 60/048, 355
BR APPLICATION NUMBER: US 60/048, 160
BR APPLICATION NUMBER: US 60/048, 160
BR FILING DATE: 1997-05-30
BR FILING DATE: 1997-05-30
BR FILING DATE: 1997-05-30
BR APPLICATION NUMBER: US 60/048, 351
BR FILING DATE: 1997-05-30
BR APPLICATION NUMBER: US 60/054, 804
BR FILING DATE: 1997-05-30
BR APPLICATION NUMBER: US 60/054, 804
BR FILING DATE: 1997-06-05
BR FILING DATE: 1997-06-05
BR FILING DATE: 1997-08-19
BR FILING DATE: 1997-08-19
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                                                PRIOR APPLICATION NUMBER: US 60/
PRIOR FILING DATE: 1997-05-30
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US-09-984-245-196
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Best Local Similarity
Matches 472; Conserv
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AETLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 196, Application US/09984245
Patent No. US20020165374A1
GENERAL INFORMATION:
APPLICANT: Young et al.
TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: P2004P1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION NUMBER: PCI/USSO/USSIL
PRIOR APPLICATION NUMBER: US 60/041,277
PRIOR PELING DATE: 1997-03-21
PRIOR PELING DATE: 1997-03-21
PRIOR PELING DATE: 1997-03-21
PRIOR FILING DATE: 1997-03-21
PRIOR FILING DATE: 1997-03-21
PRIOR APPLICATION NUMBER: US 60/041,281
PRIOR APPLICATION NUMBER: US 60/048,094
PRIOR PELING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,135
PRIOR APPLICATION NUMBER: US 60/048,135
PRIOR PELING DATE: 1997-05-30
PRIOR PELING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,187
PRIOR PELING DATE: 1997-05-30
PRIOR PELING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,187
PRIOR PELING DATE: 1997-05-30
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                                                                                TSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGI
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                                                               5 KKOKTEN-----QOKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTI
                                 Gaps
Length 624;
 79.5%; Score 2602; DB 9; 77.1%; Pred. No. 6.1e-226;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 196, Application US/09983966
Fublication No. US20030060619A1
GENERAL INFORMATION 1.
APPLICANT: Young et al.
TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: P2004P1
CURRENT APPLICATION NUMBER: US/09/983,966
CURRENT FILING DATE: 2001-10-29
FRIOR APPLICATION NUMBER: 09/154,707
FRIOR APPLICATION NUMBER: P07-VUS98/05311
PRIOR FILING DATE: 1998-09-17
FRIOR FILING DATE: 1998-09-17
FRIOR FILING DATE: 1998-03-19
FRIOR APPLICATION NUMBER: US 60/041,277
FRIOR APPLICATION NUMBER: US 60/041,276
FRIOR FILING DATE: 1997-03-21
FRIOR FILING DATE: 1997-03-21
FRIOR FILING DATE: 1997-03-21
FRIOR APPLICATION NUMBER: US 60/041,281
FRIOR APPLICATION NUMBER: US 60/041,281
FRIOR APPLICATION NUMBER: US 60/041,281
FRIOR APPLICATION NUMBER: US 60/048,094
FRIOR APPLICATION NUMBER: US 60/048,094
                               Mismatches
                                 67;
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                                 Conservative
                Similarity
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                                                                                                           ALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 196, Application US/10143090
PUblication No. US20030069406A1
GENERAL INFORMATION:
TITLE OF INVEWION: 87 Human Secreted Proteins
FILE REFERENCE: PZ004P1
CURRENT APPLICATION NUMBER: US/10/143,090
CURRENT FILING DATE: 2002-05-13
PRIOR APPLICATION NUMBER: 09/154,707
NUMBER OF SEQ ID NOS: 343
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 196
LENGTH: 624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     67; Mismatches
                                                                                                                                                                                                                                                                                                                                                                          599 KAWKVLTDYYRS 610
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609 KAWTVLTEYYKS 620
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US-10-143-090-196
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           239 AEAETLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLDDGVINMSIPI 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVR 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VLPVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKM 358
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                                PRIOR FILING DATE: 1997-05-30
PRIOR FILING DATE: 1997-05-30
PRIOR PELICATION NUMBER: US 60/048,135
PRIOR FILING DATE: 1997-05-30
PRIOR PLICATION NUMBER: US 60/048,135
PRIOR PLICATION NUMBER: US 60/048,187
PRIOR PELICATION NUMBER: US 60/048,187
PRIOR PELICATION NUMBER: US 60/048,187
PRIOR FILING DATE: 1997-05-30
PRIOR FILING DATE: 1997-05-30
PRIOR PELICATION NUMBER: US 60/048,186
PRIOR FILING DATE: 1997-05-30
PRIOR PELICATION NUMBER: US 60/048,186
PRIOR FILING DATE: 1997-05-30
PRIOR PELICATION NUMBER: US 60/048,131
PRIOR PELICATION NUMBER: US 60/048,131
PRIOR PELICATION NUMBER: US 60/048,131
PRIOR PELICATION NUMBER: US 60/048,355
PRIOR PELICATION NUMBER: US 60/048,351
PRIOR PELICATION NUMBER: US 60/048,154
PRIOR PELICATION NUMBER: US 60/048,154
PRIOR PELICATION NUMBER: US 60/048,154
PRIOR PELICATION NUMBER: US 60/054,804
PRIOR PELICATION NUMBER: US 60/054,804
PRIOR PELICATION NUMBER: US 60/056,370
PRIOR PELING DATE: 1997-05-30
PRIOR PELING DATE: 1997-05-30
PRIOR PELING DATE: 1997-05-30
PRIOR PELING DATE: 1997-05-30
NUMBER: US 60/048,350
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ORGANISM: Homo sapiens
US-09-983-966-196
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OY 419 ALLMODTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGYLDPKSTIV 478	6-239-40 ce 40, Application US/10 LineOrkArion: 0. US20030036074A LineOrkArion: CANT: Glucksmann, Maria CANT: Kapeller-Liberman OF INVENTION: 0. US200 OF INVENTION: NO. US200 OF INVENTION: UDIQUITI REFERENCE: 35800/247645 NT APPLICATION NUMBER: 09 FILING DATE: 2000-02-29 APPLICATION NUMBER: 09 FILING DATE: 2001-02-15 APPLICATION NUMBER: 09 FILING DATE: 2000-03-15 APPLICATION NUMBER: 09 FILING DATE: 2000-03-15 APPLICATION NUMBER: 09 FILING DATE: 2000-03-15 APPLICATION NUMBER: 09 FILING DATE: 2000-03-14	TCATION UNDERS: 00/191,/90  NG DATE: 2000-03-24  ICATION NUMBER: 09/808,767  NG DATE: 2001-03-15  SEQ ID NOS: 60  FastSEQ for Windows Version 4.0  62  Artificial Sequence  ORMATION: Pfam consensus sequence	Ouery Match Best Local Similarity 67.9%; Score 571.5; DB 9; Length 162; Best Local Similarity 67.9%; Pred. No. 1.1e-43; Batches 110; Conservative 17; Mismatches 32; Indels 3; Gaps 1; Oy 1RGCTVWLTGLSGAGKTTISFALEEVLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENI 100
419 ALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRWKQHAAVLEEGVLDPKSTIV 478	RESULT 6 US-09-771-161A-244 US-09-771-161A-244 Patent No. US-00020110811A1 GENERAL INFORMATION: WARIANTS TITLE OF INVENTION: VARIANTS OF PROTEIN KINASES FILE REFERENCE: 802620-2005.1 CURRENT APPLICATION NUMBER: US/09/771,161A CURRENT APPLICATION NUMBER: US/09/771,161A FILE REFERENCE: 2000-11-28 PRIOR APPLICATION NUMBER: 13676 PRIOR FILING DATE: 2000-06-15 PRIOR FILING DATE: 2000-06-15 PRIOR FILING DATE: 2000-04-12 SPRIOR FILING DATE: 2000-04-12 NUMBER OF SEQ ID NOS: 273 SOFTWARE: Patentin version 3.0 SEQ ID NO 244 ILENGEN PRIOR SAPINGEN SAPINGEN SOFTWARE: PATENTION UNBER: 135619 NUMBER OF SEQ ID NOS: 273 SOFTWARE: PATENTION UNBER: US/09-171-161A-244	Query Match         79.1%;         Score 258%;         DB 10;         Length 624;           Best Local Similarity         76.6%;         Pred. No. 1.1e-224;         69;         Indels         6;         Gaps         1;           Matches         469;         Conservative         68;         Mismatches         69;         Indels         6;         Gaps         1;           5         KKOKTEN         FOQKSTNVVYQAHHVSRNKGQVVGTRGGFRGCTVWLTGLSGAGKTT1         58         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	179 DSDYERPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHYR 238  189 DSEYERPEAPELVLKTDSCDVNDCVQOVELLQERDIVEVDASYEVKELYVPENKLHLAK 248  239 AEAFTLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEVLQWMHFDTLLDDGVINMSIPI 298  18 :

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EXON NUCLEIC ACID PROBES USEFUL FO
                                                                           77 DGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRENAR-KI 135
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETPERVLKTN 195
1 RGCTVWFTGLSGSGKSTIANALERKLFAQGISVYLLDGDNVRHGLNKDLGFSEEDREENI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   17 NVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSHAIPCYSL 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7 NVVWHSHPVTVQQR----ELHHGHRGVVLWFTGLSGSGKSTVAGALEBALHKLGVSTYLL 62
                                                101 RRIAEVAKLFADAGLVCITSFISPFAKDRENARKIH----ESAGLPFFEIFVDAPLNICES
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TITLE OF INVENTION: HUMAN GENOME-DERIVED SINGLE EXON NUCLEI
TITLE OF INVENTION: GENE EXPRESSION ANALYSIS, BY MICROARRAY
                                                                                                                                                                            APPLICANT: Forsyth, R. Allyn
APPLICANT: Ohlsen, Karl L.
APPLICANT: Zyskind, Judith W.
TITLE OF INVENTION: Genes identified as required for
TITLE OF INVENTION: proliferation of E. coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 10;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14.6%; Score 476.5; 50.2%; Pred. No. 5.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NUMBER OF SEQ ID NOS: 481
SOFTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CURRENT APPLICATION NUMBER: US/09/741,669
CURRENT FILING DATE: 2000-12-19
PRIOR APPLICATION NUMBER: US 60/173005
NUMBER OF EED.
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CURRENT APPLICATION NUMBER: US/09/864,761
CURRENT FILING DATE: 2001-05-23
PRIOR APPLICATION NUMBER: US 60/180,312
PRIOR FILING DATE: 2000-02-04
PRIOR PELICATION NUMBER: US 60/207,456
PRIOR FILING DATE: 2000-05-26
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Patent No. US20020048763A1
GENERAL INFORMATION:
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Patent No. US20020022718A1
GENERAL INFORMATION:
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APPLICANT: Rank, David R.
APPLICANT: Hanzel, David K.
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US-09-741-669-457
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RRIAEVAKLFADAGLVCITSFISPFAKDRENARKIH---ESAGLPFFEIFVDAPLNICES 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61 RRVGEVAKLFADAGLIVLTSFISPTRADRDQARELHEDGEEAGLKFIEVFVDTPLEVCEQ 120
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                    APPLICANT: Silos-Santiago, Inmaculada
TITLE OF INVENTION: 20685, 579, 17114, 23821, 33894, and
TITLE OF INVENTION: 32613, No. US20030077626A1e1 Human Transporters
TITLE OF INVENTION: 32613, No. US20030077626A1e1 Human Transporters
FILE REFERENCE: 35800/249468
CURRENT APPLICATION NUMBER: US/10/199,485
PRIOR APPLICATION NUMBER: 09/795,693
PRIOR PILING DATE: 2001-02-28
PRIOR PLING DATE: 2000-02-29
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TITLE OF INVENTION: 20685, 579, 17114, 23821, 33894, and

TITLE OF INVENTION: 32613, No. US20020068710A1e1 Human Transporters

FILE REFERENCE: 35800/20292

CURRENT APPLICATION NUMBER: US/09/795,693

CURRENT FILING DATE: 2001-02-28

PRIOR PPLICATION NUMBER: 60/185,906

PRIOR FILING DATE: 2000-02-29
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17.5%; Score 571.5; DB 9;
67.9%; Pred. No. 1.1e-43;
tive 17; Mismatches 32;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OTHER INFORMATION: Pfam consensus sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OTHER INFORMATION: Pfam consensus sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FastSEQ for Windows Version 4.0
                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQ ID NOS: 42
SOFTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 40, Application US/10199485 Publication No. US20030077626A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Seguence 40, Application US/09795693
                                                                                                                                              APPLICANT: Glucksmann, Maria A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORGANISM: Artificial Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM: Artificial Sequence
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Best Local Similarity 67.9%
Matches 110; Conservative
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Best Local Similarity 67.9%;
Matches 110; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Patent No. US20020068710A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER OF SEQ ID NOS:
SOFTWARE: FastSEQ for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
APPLICANT: Glucksma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-10-199-485-40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-795-693-40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQ ID NO 40
LENGTH: 162
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APPLICANT: Law, Debbie
APPLICANT: Topper, James
TITLE OF INVENTION: No. US20020082206Alel Polynucleotides from Atherogenic Cells a
TITLE OF INVENTION: Thereby
                                                                                                                                                                                                                                                                                                                                                                      55 MSGIKKOKTENQOKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKNNDKF 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100 IRRIAEVAKLFADAGLVCITSFISPFAKDRENARK--IHESAGLPFFEIFVDAPLNICES 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               86 LORIAFVASELTRAGAAVIASPIAPYEHSRQMARDTILKGGGSNNFFLIHVATPLEYCEK 145
                                                                                                                                                                                                                                                                                                                                            9
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  41 RGCTVWLTGLSGAGKTTISFALEEYLVSHAIPCYS-LDGDNVRHGLNRNLGFSPGDREEN
                                                                                                                                                                                                                                                                                              Gaps
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    consult PALM or file wrapper

                                                                                                                                                                                                                                           Length 174;
                                                                                                                                                                                                                                                                                            13; Indels
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                                                                                                                                                                                                                                           Score 323; DB 9;
Pred. No. 3.1e-21;
0; Mismatches 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1.1e-12;
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TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: PZ004P1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 17; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6.8%; Score 221.5; 41.9%; Pred. No. 4.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILE REFERENCE: 21402-013 (Cura-313)
CURRENT APPLICATION NUMBER: US/09/867,550
CURRENT FILING DATE: 2001-09-20
PRIOR APPLICATION NUMBER: USSN 60/208,427
PRIOR FILING DATE: 2000-05-30
NUMBER OF SEQ ID NOS: 2125
SOFTWARE: FASTERO for Windows Version 4.0
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Patent No. US20020165374A1
GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       115 CPGGVLVSHAIPVNSWMG 132
2001-03-16
                                                                                                                                                                                                                                                                                                                                                                                                                                           61 ALEEYLVSHAIPCYSLDG 78
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146 HDRRGNYAKARRGEVK 161
                       Prior application data removed
NUMBER OF SEQ ID NOS: 761
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 635
                                                                                                                                                                                                                                           Query Match 9.9%;
Best Local Similarity 83.3%;
Matches 65; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Leach, Martin D. APPLICANT: Mehraban, Fuad, APPLICANT: Conley, Pamela APPLICANT: Law, Debbie
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Matches 57; Conservative
                                                                                                                                            TYPE: PRT
CORGANISM: Homo sapiens
US-09-809-391-635
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US-09-867-550-96
CURRENT FILING DATE:
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                                                                                                                     LENGTH: 174
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OTHER INFORMATION: EXPRESSED IN PLACENTA, SIGNAL = 1.6

OTHER INFORMATION: EXPRESSED IN LUNG, SIGNAL = 1.3

OTHER INFORMATION: EXPRESSED IN HEART, SIGNAL = 1.3

OTHER INFORMATION: EXPRESSED IN BRAIN, SIGNAL = 1.2

OTHER INFORMATION: EXPRESSED IN BRAIN, SIGNAL = 1.4

OTHER INFORMATION: SWISSPROT HIT: 095340, EVALUE 4.00e-33

US-09-864-761-39981
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EXPRESSED IN FETAL LIVER, SIGNAL = 1.2
EXPRESSED IN BONE MARROW, SIGNAL = 1.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: Annomax Sequence Listing Engine vers. 1.1 SEQ ID NO 39981
LENGTH: 65
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TITLE OF INVENTION: 186 Human Secreted proteins
FILE REFERENCE: P2002P2
CURRENT APPLICATION NUMBER: US/09/809,391
                                                                                                                                                                                                                                                                                  PRIOR APPLICATION NUMBER: PCT/USO1/00669
PRIOR FILING DATE: 2001-01-30
PRIOR PLICATION NUMBER: PCT/USO1/00665
PRIOR PLING DATE: 2001-01-30
PRIOR PLING DATE: 2001-01-01
PRIOR PLING DATE: 2001-01-01
PRIOR PLING DATE: 2001-01-01
PRIOR PLING DATE: 2001-01-01
                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE: 2001-01-30
APPLICATION NUMBER: PCT/US01/00663
FILING DATE: 2001-01-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: PCT/US01/00662
FILING DATE: 2001-01-30
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FILING DATE: 2001-01-30
                                                                                                                                          APPLICATION NUMBER: PCT/USO1/00666
FILING DATE: 2001-01-30
                                                                                                                                                                                          APPLICATION NUMBER: PCT/US01/00667
FILING DATE: 2001-01-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION NUMBER: US 60/234,687
PRIOR FILING DATE: 2000-09-21
PRIOR APPLICATION NUMBER: US 09/608,408
PRIOR FILING DATE: 2000-06-30
PRIOR APPLICATION NUMBER: US 09/774,203
PRIOR FILING DATE: 2001-01-29
                                                                                                                                                                                                                                           APPLICATION NUMBER: PCT/US01/00664
                                                                  FILING DATE: 2000-10-04
APPLICATION NUMBER: US 60/236,359
FILING DATE: 2000-09-27
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Publication No. US20030049618A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                  FILING DATE: 2001-01-30
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NUMBER OF SEQ ID NOS: 49117
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ORGANISM: Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OTHER INFORMATION: POTHER INFORMATION: FOTHER INFORMATION: FOTHER INFORMATION: FOTHER INFORMATION: FOTHER INFORMATION: FOTHER INFORMATION: FOTHER INFORMATION:
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APPLICANT: Young et al.
TITLE OF INVENTION: 87 Human Secreted Proteins
                             FILE REFERENCE: P20041
CURRENT APPLICATION NUMBER: US/09/966,262
CURRENT FILING DATE: 2001-10-01
PRIOR APPLICATION NUMBER: US 09/154,707
PRIOR FILING DATE: 1998-09-17
                                                                                                                                 APPLICATION NUMBER: PCT/US98/05311
                                                                                                                                                 FILING DATE: 1998-03-19
PPLICATION NUMBER: US 60/041,277
FILING DATE: 1997-03-21
APPLICATION NUMBER: US 60/042,344
                                                                                                                                                                                                                                                           FILING DATE: 1997-03-21
APPLICATION NUMBER: US 60/041,281
FILING DATE: 1997-03-21
APPLICATION NUMBER: US 60/048,094
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PLICATION NUMBER: US 60/048,135
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LICATION NUMBER: US 60/048,187
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LICATION NUMBER: US 60/048,099
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LICATION NUMBER: US 60/048,352
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APPLICATION NUMBER: US 60/048,186
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ION NUMBER: US 60/048,095
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FILING DATE: 1997-05-30
APPLICATION NUMBER: US 60/048,355
                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: US 60/048,188
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APPLICATION NUMBER: US 60/048,131
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Pred. No. 1.2e-12;
3; Mismatches 1
       APPLICATION NUMBER: PCT/US98/05311
FILING DATE: 1998-03-19
                   APPLICATION NUMBER: US 60/042,344 FILING DATE: 1997-03-21 APPLICATION NUMBER: US 60/041,276
                                                                                                                                                                                                                                                                                                           UMBER: US 60/048,135
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CATION NUMBER: US 60/048,099
                                                                                                                                       ATE: 1997-03-21
ION NUMBER: US 60/041,281
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NUMBER: US 60/048,350
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LICATION NUMBER: US 60/048,352
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LICATION NUMBER: US 60/048,069
                                                                                                                                                                         FILLING DATE: 1997-03-21
APPLICATION NUMBER: US 60/048,094
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PLICATION NUMBER: US 60/048,187
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LICATION NUMBER: US 60/048,131
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Best Local Similarity 90.2
Matches 37; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Homo sapiens
US-09-984-245-340
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                                             PRIOR APPLIC
PRIOR FILING
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US 60/048,350

-05-30 1997-05-30 us 60/050,937

1997-05-30

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Pred. No. 1
                                   FILING DATE: 1997-05-30
APPLICATION NUMBER: US 60/048,154
FILING DATE: 1997-05-30
                                                                                                         FILING DATE: 1997-08-05
APPLICATION NUMBER: US 60/056,370
FILING DATE: 1997-08-19
                                                                                                                                                            APPLICATION NUMBER: US 60/060,862
FILING DATE: 1997-10-02
FILING DATE: 1997-05-30
APPLICATION NUMBER: US 60/048,351
                                                                                        APPLICATION NUMBER: US 60/054,804
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ilarity 90.28;
Conservative
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Best Local Similarity
Matches 37; Conserv
                                                                                                                                                                                                                                                                                      ORGANISM: HOMO
US-09-966-262-340
                                                                                                                                                                                                                                   SEQ ID NO 340
LENGTH: 41
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Gaps

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Indels

486 LYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDL 526 

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Search completed: May 30, 2003, 12:28:53 Job time : 49 secs

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GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.	OM protein - protein search, using sw model	<pre>Run on: May 30, 2003, 12:15:39 ; Search time 43 Seconds</pre>	Title: US-09-898-165B-7 Perfect score: 3271 Sequence: 1 MSGIKKQKTENQQKSTNVVYMAPKAWKVLTDYYRSEMDKN 615	Scoring table: BLOSUM62 Gapop 10.0, Gapext 0.5	Searched: 283224 segs, 96134422 residues	Total number of hits satisfying chosen parameters: 283224	Minimum DB seq length: 0 Maximum DB seq length: 2000000000	Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries	Database : PIR_73:* 1: pir1:* 2: pir2:* 3: pir3:*	
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Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	adenylyl-sulfate k	adenylyl-sulfate k	3'-phosphoadenosin	sulfate adenylyltr						sulfate adenylyltr	probable sulfate a	sulfate	adenylylsulfate ki		adenylylsulfate ki	adenylyl-sulfate k	adenylyl-sulfate k	adenylylsulfate ki	adenosine 5-phosph	hypothetical prote	Ξ	adenosine 5'-phosp	e 5′-	S	adenyly1-sulfate k	ďΩ	probable adenylyl-	TO.	adenylyl-sulfate k	
SUMMARIES	ID	JW0087	JC4383	T24918	S44079		S44267	S44943	T14475	T52659	T01204	T08594	T50101	E96912	S17244	A69839	T06100	AF0408	A83836	AH0856	A87433	B65056	.D91079	E85924	S47640	T08076	F82062	077	C69877	AD3471	-
	Length DB																			201 2											
dР	Query Match L	7	72.	57.	39.	39.	38.	38.	38.	38.	37.	37.	17.	16.	16.	15.	15.	15.	14.	-	14.	14.	•	4	4	4	4.	4	13.8	e.	
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probable adenylyl-adenylyl-adenylyl-sulfate k	adenyly1-sulfate k	adenyıyı-sumate k adenylylsulfate ki	ATP sulfurylase, 1	probable adenylyl-	adenylyl-sulfate k	adenosine 5'-phosp	sulfate adenylyltr	adenylyl-sulfate k	sulfate adenylyltr	adenylyl-sulfate k	sulfate adenylyltr	sulfate adenylyltr	sulfate adenylyltr
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633 2 H9593 641 1 ZZZRN	77	7 7	7	-	<del>~</del> 4	7	7	-	7	Н	-	7	7
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633 2 641 1	13.3 641 2	13.1 208 2	13.0 660 2	12.8 546 1	12.7 620 1	12.4 196 2	12.2 387 2	12.1 177 1	11.9 381 2	11.7 214 1	11.4 574 1	11.3 379 2	11.3 573 1

# ALIGNMENTS

	RESULT 1 JW0087 adenylyl-sulfate kinase (EC 2.7.1.25) - human N;Alternate names: adenosine 5'-phosphosulfate kinase; N;Contains: adenylylsulfate kinase (EC 2.7.1.25); sulfa C;Species: Homo sapiens (man) C;Species: Homo sapiens C;Accession: JW0087 A;Title: CDNA cloning, expression, and characterization A;Reference number: JW0087; MUID:98312048; PMID:9648242 A;Residues: 1-624 <yan> A;Molecule type: MRN A;Residues: 1-624 <yan> A;Cross-references: GB:AF033026; NID:g3378100; PIDN:AAC A;Experimental source: Brain C;Function: ASKF&gt; A;Description: as adenylylsulfate kinase catalyzes the C;Function: SATF&gt; A;Description: as sulfate adenylyltransferase catalyzes</yan></yan>	RESULT 1 JW0087 adenyly1-sulfate kinase (EC 2.7.1.25) - human Nilternate names: adenosine 5'-phosphosulfate kinase; PAPS NiContains: adenyly1sulfate kinase (EC 2.7.1.25); sulfate adenyly1transferase (EC 2.7.1.25); sulfate adenyly1transferase; papers (EC 2.7.1.25); sulfate and A A; Sulfate adenyly1transferase (EC 2.7.1.25); sulfate and A A; Sulfate adenyly1transferase catalyzes the reaction of sulfate and A
	C; Superfaulty: animal 3' Phosphoadenosine-5'-phosphosulfate: C; Keywords: multifunctional enzyme; nuclectide binding; nucle 5:52-215/Domain: adenylylsulfate kinase homology <ask>F; 52-66/Region: nuclectide-binding motif A (P-loop) F; 226-620/Domain: sulfate adenylyltransferase homology <sat>F; 133/Binding site: phosphate (Ser) (covalent) #status predit ouery Match  79.5%; Score 2602; DB 1; Length Best Local Similarity 77.1%; Pred. No. 6.4e-186; Matches 472; Conservative 67; Mismatches 67; Indeligned</sat></ask>	synthetase; adesotidyltransfercted 624;
	0.7   5   KKQKTEN	KROKTENOOKSTUNVYQAHHYSRNKRGOYVGTRGGFRGGTWALTGLSGAGKTTI 58
• • • • • • • • • • • • • • • • • • • •	Qy 179 DSDYEKPETPERVLKTNLSTVSDC   119 DSDYEKPETPERVLKTDSCDVNDC   189 DSEYEKPEAPELVLKTDSCDVNDC   239 AEAETLPSLSITKLDLQWVQVLSE   11111111111111111111111111111111111	DSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVR 238   :

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Spescription: as adenylylsulfate kinase catalyzes the phosphorylation of adenylylsul C; Function: <SATF>
C; Function: <SATF>
C; Function: as sulfate adenylyltransferase catalyzes the reaction of sulfate and A b.Description: as sulfate adenylyltransferase catalyzes the reaction of sulfate and A C; Superfamily: animal 3'-phosphoadenosine-5'-phosphosulfate synthetase; adenylylsulfate (;Keywords: multifunctional enzyme; nucleotide binding; nucleotidyltransferase; P-loop F; 56-719/Pomain: adenylylsulfate kinase homology <ASK>
F; 180-190/Domain: 3'-phosphoadenosine-5'-phosphosulfate binding #status predicted <PAF; 137/Binding site: phosphâte (Govalent) #status predicted
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     186 QLYAGNKSIDECVQEVVSLLQKNGVVPESAVNIVKELFVPESGLEHAKAEIVDLPTMEIT 245
                                                                                 485
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                                                                                                                                                                                                                                                                                                                                                                                 ERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYAGP 490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAPGLTSVEIIPF 550
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                                                        KLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLDDGVINMSIPIVLPVSAEDKTRL
                                                                                                                                                                   EGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKMVMESGDWLVGGD
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Pred. No. 1.4e-132;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3'-phosphoadenosine-5'-phosphosulfate synthetase -
N;Alternate names: protein 114G10.1
C;Sports: Caenorhabditis elegans
Grafe: 22-Oct.1999 #sequence_revision 22-Oct-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C: Accession: T24918
R:Wild, A. T124918
S: Wild, A. T124918
S: Wild of the EMBL Data Library, January 1996
A: Reference mumber: 219954
A: Accession: T24918
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Best Local Similarity 56.5%;
Matches 362; Consedvative 10
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C. Joacession: JOSO # Segquence_revision 19-Apr-1996 #text_change 03-Jun-2002

C. Accession: JOSO # Seguence_revision 19-Apr-1996 #text_change 03-Jun-2002

R. Rosenthal, E.: Leustek, T.
Gene 165, 243-248, 1995

A. Title: A multifunctional Urechis caupo protein, PAPS synthetase, has both ATP sulfuryl A; Reference number: JOSO # MULD: 96096529; PMID: 8522184

A. Molecule type: MRNA

A. Residues: 1-610 - RROS

A. Cross-references: GB: L39001; NID: 9705384; PIDN: AAB00139.1; PID: 9705385

C. Genetics:
A. Genetics: A Genet
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                                                                                                                                    125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           adenylyl-sulfate kinase (EC 2.7.1.25) - spoonworm (Urechis caupo)
N.Alternate names: adenosine 5' phosphosulfate kinase; PAPS
N.Contains: adenylylsulfate kinase (EC 2.7.1.25); sulfate adenylyltransferase c; Species: Urechis caupo
C; Date: 17-Jan-1996 #sequence_revision 19-Apr-1996 #text_change 03-Jun-2002
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                               VMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGH
                                                                                                                                                                                                                                                                                                                           AIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSM
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us-09-898-165b-7.rpr

TYCSDCVHOVVELLOEONIVPP	Db 134 AFISPPOEDRIDARKHESENWETCHWINSTLENCEDROPROLYKRARAGOILGF9019 190 SURKERPEPROKUKLINGSTANGELORDHYPTI-IKDITELPPER-LIDH 239 194 SAYEPPEREKLINGSTANGELORDHYPTI-IKDITELPPER-LIDH 239 194 SAYEPPEREKLILDARKEGYOGVOVANCHELDERGEGYOLDKHYRVAPY 315 DASHERERGEGYONGTOLOKHYRVAPY 316 194 SAYEPPEREKLILDARKEGYOGVOVANCHAESKAGILDPERFERGEGORGHYRVAPELY 399 237 VPARAFILDARGEGYOVANCHAESKAGILDRERGEGORGHYRVAPELY 399 314 GEKSDOKEDSWENDONOVALSCHARKEGYOLDKHYRVAPY 317 DASHEGYRCHANGEGYNALLEDRERGY 399 315 BIRKERSCSRWATCTCTHHHIRWHSCADALAGCRAVALKHARVANGVARVANGVAKKANGVARVANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKANGVARVANGVAKKANGVARVANGVAKANGVARVANGVAKKANGVARVANGVAKKANGVARVANGVAKANGVARVANGVAKANGVARVANGVAKANGVARVANGVAKANGVARVANGVAKA
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RESULT 7 S44943 sulfate adenylytransferase (EC 2.7.7.4) met3-1 precursor - Arabidopsis thaliana N;Alternate names: ATP sulfurylase; sulfate adenylytransferase APS2 C;Species: Arabidosais thaliana (mouse-ear cress)	C;Date: 06-Oct-1994 #sequence_revision 10-Nov-1995 #text_change 16-Jul-1999 C;Accession: S44943; S68024; S68202 R;Klonus, D. R;Klonus, D. submitted to the EMBL Data Library, May 1994	A; Description: ATP-sulfurylase cDNA clone from A.thallana. A; Reference number: S44943 A; Accession: S44943 A; Molecule type: mRNA	487404 jana and	ine-5'-triphosphate-sulfurylase cDNAs from Arabidopsis thaliana and analysis of a rec A; Reference number: S68024; MUID:96019964; PMID:7487067 A; Accession: S68024 A; Molecule type: mRNA A; Residues: 1-476 < MUN> A; Cross-references: EMBL:U06276; NID:91228103; PIDN:AAA92351.1; PID:91228104	A:Experimental source: clone APS2 C:Genetics: A:Genoe: met3-1 A:Genome: nuclear C:Superfamily: sulfate adenylyltransferase met3-1; sulfate adenylyltransferase homolo	ed <mat></mat>	242; Conservative 73 207 VELLQEQNIVPYTIIK :  : ::  42 LNLVYKRNLTMQSVSKMTVF	QY 254 LQWVQVLSEGWATPLKGFMREKEYLQVMHFDTL-LDDGV-INMSIPIVLPVSAEDKTRLE 311   :   :     :   :   :   :   :   :   :   :   :   :   :   :   :   :   :   :   :	Qy 312 GCSKEVLAHGGRRVALLEDAEFYEHRKEERCSRVWGTTCTKHPHI-KMVMESGDMLVG 368	QY 369 GDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGHALLMQDTCRR 428	Qy 429 LLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYA 488	489 GPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAPGLTSVEII           :: :                    :   :	OY 549 PFRVAAYNKAKKAMDFYDPARHNEFDFISGTRWRKLAREGENPPDGFMAPKAWKYLTDYY 608	461 ES
342 CSRVWGTTCTKHPHI-KMVMESGDMLVGGDLQVLEKIRNNDGLDQYRLTPLELKQKCKEM 400 :                    : : : :	520 360	521 ETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTR 580 			C: Accession: S67498; S44267 R: Klonus, D.: Hoefgen, R.; Willmitzer, L.; Riesmeier, J.W. Plant J. 6, 105-112, 1994 A: Title: Isolation and characterization of two cDNA clones encoding ATP-sulfurylases from the Reference number: S67497; WUID:95004649; PMID:7920699 A: Recession: S67498		outeriaming: Sulface adentylyttransferase met3-1; Sulface adentylyttransferase nomology Keywords: chloroplast; nucleotidyltransferase 50-448/Domain: sulfate adentylytransferase homology <sat> Query Match 38.9%; Score 1274; DB 2; Length 463;</sat>	Best Local Similarity 61.4%; Pred. No. 4.2e-87; Matches 239; Conservative 60; Mismatches 86; Indels 4; Gaps 4; 226 ELEVPENKLDHVRAEAETLPSLSITKLDLOWVOVLSEGWATPLKGEMREKEYLOVMHFDT 285	60 ELIVEEPQRDLKRRQALSLPQIKLSKIDIQWVHVLSEGWASPLKGFMRESEFLQTLHFNS 119 286 L-LDDG-VINMSIPIVLPVSAEDKTRLEGCSKFVLAHG-GRRVALLRDAEFYEHRKEERC 342	120 LRLGDGSVVNMSVPIVLAIDDSNKNNIGDSSSVALVDDKDNFIAILNDIETKHNKEERT 179 343 SRVWGTTCTKHHIKM-VMESGDWLQDLEKIRNNDGLDQYRLTPLELKQKCKEMN 401	180 AFTWGTTAPGLEYAEQAITHAGNWLIGGDLEVIEPIKYHDGLDRFRLSPAELRDEFTRRN 239 402 ADAVFAFQLRNEVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQ 461	ADAVFAFQLRNPVHNGHALLMTDTRRRLLEMGYKNPVLLLHPLGGYTKADDVPLEWRWKQ HAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPE	SOU HEMVLEDGVLDPETTVVSIFPSPMHYAGFTEVDWHAKARINAGANFYIVGRDPAGMGHPL 359  522 TKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTRM 581  1:  :  :  :  :  :  :  :  :  :  :  :  :	

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A;Description: EC 2.7.7.4 [validated, MUID:20267847]
A;Pathway: sulfate assimilation
C;Superfamily: sulfate adenylyltransferase met3-1; sulfate adenylyltransferase homclo C;Keywords: chloroplast; nucleotidyltransferase
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A;Title: Functional characterization of a gene encoding a fourth ATP sulfurylase isof
A;Reference number: 226165
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A;Residues: 1-489 <BOL>
A;Cross-references: EMBL:AF016305; NID:g2738749; PIDN:AAB94542.1; PID:g2738750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SRVWGTTCTKHPHI-KMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMN 401
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Pred, No. 5,2e-86;
                                                         A;Accession: T52659
A;Status: preliminary; translated from GB/EMBL/DDBJ
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A;Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                  PIDN: CAB42640.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                     38 5%; Scott 60.7%; Pred. No. 5.1.
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                                                                                                      A; Molecule Lype: mRNA
A; Residues: 1-469 < HAT>
A; Cross-references: EMBL:AJ012586; PIDN:CAB
A; Experimental source: cultivar Columbia
C; Genetics:
A; Gene: aps4
A; Genome: nuclear
C; Function:
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C;Bate: 24-Oct-2000 #sequence_revision 24-Oct-2000 #text_change 03-Nov-2000
C;Accession: T52659
E;Harzfeld, Y:. Lee, S.; Lee, M.; Leustek, T.; Saito, K.
Gene 248, 51-58, 2000
                                                                                           Accession: Target and the sequence revision 20-Sep-1999 #text_change 21-Jan-2000 C; Date: 20-Sep-1999 #sequence_revision 20-Sep-1999 #text_change 21-Jan-2000 C; Date: 20-Sep-1999 #sequence_revision 20-Sep-1999 #text_change 21-Jan-2000 C; Accession: Tid475
R; Hatzfeld, Y.; Logan, H.M.; Cathala, N.; Davidian, J.C.
Submitted to the EMBL Data Library, September 1996
A; Reference number: Z18111
A; Recience number: Z18111
A; Residues: 12811
A; Residues: 1483 *ART>
A; Residues: 1483 *ART>
A; Residues: 1483 *ART>
A; Tross references: EMBL: U69694; NID: 91589912; PID: 91589913
C; Genetics:
A; Genetics:
A; Genetics:
A; Genetics:
A; Thirtons: 185/2; 407/3; 436/3
C; Runction:
A; Description: catalyzes the activation of sulfate to adenylylsulfate
C; Superfamily: sulfate adenylyltransferase met3-1; sulfate adenylyltransferase
F; 68-466/Domain: sulfate adenylyltransferase homology <STR>
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                                                   (EC 2.7.7.4) ASBo precursor - wild cabbage
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                                                   sulfate adenylyltransferase (EC 2.7
N;Alternate names: ATP sulfurylase
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Best Local S
Matches 255
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C; Species: Clostridium acetobutylicum
C; Species: Clostridium acetobutylicum
C; Date: 14 Sep-2001 #sequence_revision 14-Sep-2001 #text_change 30-Sep-2001
C; Accession: E96912
R; Nolling, J.; Berton, G.; Omelchenko, M.V.; Markarova, K.S.; Zeng, Q.; Gibson, R.; L.; Daly, M.J.; Benett, G.N.; Koonin, E.V.; Smith, D.R.
J. Bacteriol. 183, 4823-4838, 2001
A; Title: Genome Sequence and Comparative Analysis of the Solvent-Producing Bacterium A; Reference number: A96900; MUID:21359325; PMID:21359325
A; Accession: E96912
A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Residues: 1-202 <WOO>
A;Cross-references: EMBL:AL158056; PIDN:CAB76273.1; GSPDB:GN00066; SPDB:SPAC1782.11
A;Experimental source: strain 972h(-); cosmid c1782
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                                         294
                                                                                                                                                       521 ETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTR 580
                                                                                                                                                                              SLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRENARK 134
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          57
                                                                                                                                                                                                                                                                                                                                                                   adenylylsulfate kinase [imported] - fission yeast (Schizosaccharomyces pombe)
                                                                                                                                                                                                                                                                                                                                                                             C;Species: Schizosaccharomyces pombe
C;Date: 09-Jun-2000 #sequence_revision 09-Jun-2000 #text_change 21-Jul-2000
C;Accession: T5010
R;Wood, V; Rajandream, M.A.; Barrell, B.G.; Brown, S.; Harris, D.
A;Reference number: 225037
                           GADAVFAFQLRNPVHNGHALLMTDTRRLLEMGYQEPYPFASSVRGYTKADDVPLSWRMK
                                                                                                   401 NADAVFAFQLRNPVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMK
                                                                               QHAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHP
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        adenylylsulfate kinase [imported] - Clostridium acetobutylicum
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4.le-34;
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A,Status: preliminary; translated from GB/EMBL/DDBJ
A,Molecule type: DNA
                                                                                                                                                                                                                                    610
                                                                                                                                                                                                                                                      41; Mismatches
                                                                                                                                                                                                                                  581 MRKLAREGENPPDGFMAPKAWKVLTDYYRS
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Pred. No. 4
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Best Local Similarity 51.5%;
Matches 104; Conservative 4
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                                                                               461
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     senescence related genes
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                                                                                                 226 ELFVPE--NKLDHVRAEAETLP-SLSITKLDLOWVOYLSEGWATPLKGFMREKEYLQVMH 282
                                                                                                                                                                                140 FNAIRGODGRMYNMSVPIVLSVGDAQRRAIQADGATRVAVVDERDRPIAVLSDIEIYKHN 199
                                                                                                                                                                                                                                                        FDTL--LDDGVINMSIPIVLPVSAEDKTRL--EGCSKF-VLAHGGRRVAILRDAEFYEHR 337
                                                                                                                                                                                                                                KEERCSRVWGTICTKHPHI-KMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQK 396
                                                                                                                                                                                                                                                                                                        CKEMNADAVFAFQLRNPVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLD 456
                                                                                                                                                                                                                                                                                                                                                                                   WRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                           MPHPETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFI 576
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A;Experimental source: cv. Falcon; senescing leaves
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  probable sulfate adenylyltransferase (EC 2.7.7.4) - rape
C;Species: Brassica napus (rape)
C;Date: 11-Jun-1999 #sequence_revision 11-Jun-1999 #text_change 21-Jul-2000
C;Accession: T08594
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6
   DB 1; Length 489;
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                                         Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Title: Leaf senescence in Brassica napus: cloning of s
Reference number: 216446; MUID:97260386; PMID:9106506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 1212.5; DB 2;
Pred. No. 1.6e-82;
63; Mismatches 92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ed. No. 8.1e-84;
Mismatches 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SGTRMRKLAREGENPPDGFMAPKAWKVLTDYYRS 610
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A;MoLecule type: mRNA
A;Residues: 1-459 <BUC>
   Score 1230.5;
                   Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Buchanan-Wollaston, V.; Ainsworth, C.
Lant Mol. Biol. 33, 821-834, 1997
Fitle: Leaf senescence in Brassica na
                                       :99
 37.6%;
59.1%;
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59.0%;
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Best Local Similarity 59.0%
Matches 230; Conservative
                                         Conservative
                   Similarity
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                                       233;
Query Match
Best Local Si
Matches 233;
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C;Species: Bacillus subtilis
C;Species: Bacillus subtilis
C;Species: Bacillus subtilis
C;Species: G:Dec-1997 #sequence_revision 05-Dec-1997 #text_change 19-Jan-2001
C;Accession: A69839
E;Kunst, F: Oqasawara, N.; Moszer, I.; Albertini, A.M.; Alloni, G.; Azevedo, V.; Bar
R;Kunst, F: Oqasawara, N.; Entian, K.D.; Errington, J.; Pabret, C.; Ferrari,
A; Ehrlich, S:D.; Emmerson, P.T.; Entian, K.D.; Errington, J.; Pabret, C.; Ferrari,
Nature 390, 249-256, 1997
A;Authors: Foulger, D.; Fritz, C.; Fujita, M.; Fujita, Y.; Fuma, S.; Galizzi, A.; Gal
iech, J.; Hander, D.; Fritz, C.; Fujita, M.; Fujita, Y.; Fuma, S.; Hullo, M.
Koetter, P.; Koningstein, G.; Krogh, S.; Kumano, M.; Kurita, K.; Lapidus, A.; Lardino
A;Authors: Lauber, J.; Lazarevic, V.; Lee, S.M.; Levine, A.; Liu, H.; Masuda, S.; Mau
X;Authors: Lauber, J.; Lazarevic, V.; Lee, S.M.; Levine, A.; Liu, H.; Masuda, S.; Mau
X;Authors: Schleich, S.; Schroeter, R.; Scoffone, F.; Sekiguchi, J.; Sekowska, A.; Sea
A;Authors: Schleich, S.; Schroeter, R.; Scoffone, F.; Sekiguchi, J.; Sekowska, A.; Sea
A;Authors: Yoshikawa, H.F.; Zumstein, E.; Yoshikawa, H.; Danchin, A.; Tosato, V.; Uchiga
T.; Winters, P.; Wipat, A.; Yamamoto, H.; Yamane, K.; Yasumoto, K.; Yata, K.; Yoshila
A;Title: The complete genome sequence of the Gram-positive bacterium Bacillus subtilling
A;Acterior number: A69839
A;Acterior number: A69839
A;Acterior number: A69839
A;Acterior number: A69830
A;Acterior number: A69839
A;Acterior number: A69830
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A;Experimental source: strain 168
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                                                                                                                                                                                                                                                                                                                                          84 RISEVSKLFADSCAISITSFISPYRVDRDRARELHKEAGLKFIEIFVDVPLEVAEQRDPK 143
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                                                                                                                                                 24 GCTIWLTGLSASGKSTIACALEQLLLQKNLSAYRLDGDNIRFGLNKDLGFSEKDRNENIR
                                                                                                                                                                                                                                                                                   .02 RIAEVAKLFADAGLVCITSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVK
                                                                                               42 GCTVWLTGLSGAGKTTISFALEEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIR
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     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GLYKRARAGEIKGFTGIDSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIV 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C.Superfāmily: adenylylsulfate kinase; adenylylsulfate kinase homology c.jkeywords: nucleotide binding; P-loop F:27-186/Domain: adenylylsulfate kinase homology <ASK>F:27-186/Domain: adenylylsulfate kinase homology <ASK>F:34-41/Region: nucleotide-binding motif A (P-loop)
0;
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9
     47; Indels
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Pred. No. 6e-30;
     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    43; Mismatches
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     29;
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     99; Conservative
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A. Molecule type: DNA
A. Molecule type: DNA
A. Gross references: GB:S55315; NID:g235814; PIDN:AAB19854.1; PID:g235815
A. Gross references: GB:S55315; NID:g235814; PIDN:AAB19854.1; PID:g235815
A. Molecule type: DNA
A. Reference number: S25322; MUD:93070612; PMID:1441752
A. Molecule type: DNA
A. Molecule type: Strain S288C
A. Experimental source: strain S288C
A. Experimental source: strain S288C
A. Molecule type: DNA
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A. Molecule type: DNA
A. Experimental source: strain S288C
C. Genetics:
A. Gene: SGD: MET14; MIPS: YKL001c
A. Cross-references: SGD: S0001484; MIPS: YKL001c
A. Molecule type: MIPS: YKL001c
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N;Alternate names: adenosine-5-phosphosulfate kinase; protein YKL001c
C;Species: Saccharomyces cerevisiae
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 03-Jun-2002
C;Accession: S17244; S25323; S37811
R;Korch, C.; Mountain, H.A.; Bystroem, A.S.
Mol. Gen. Genet. 229, 96-108, 1991
A;Title: Cloning, nucleotide sequence, and regulation of MET14, the gene encoding the A;Reference number: S17244; MUID:91375456; PMID:1654509
                                                                                                                                                                                                                                                                                                                                                                                                                                         7
               A;Cross-references: GB:AE001437; PIDN:AAK78088.1; PID:g15022928; GSPDB:GN00168 A;Experimental source: Clostridium acetobutylicum ATCC824 C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        71 IPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRE 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 131 NARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETPER 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11 NQQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSHA 70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C; Superfamily: adenylylsulfate kinase; adenylylsulfate kinase homology C; Keywords: ATP; P-loop; phosphotransferase; purine nucleotide binding F; 24-187/Domain: adenylylsulfate kinase homology <ASK>F; 31-38/Region: nucleotide-binding motif A (P-loop) F; 37/Binding site: ATP (Lys) #status predicted
                                                                                                                                                                               A;Gene: CACO103
C;Superfamily: adenylylsulfate kinase; adenylylsulfate kinase homology
                                                                                                                                                                                                                                                                                                                                     DB 2; Length 200;
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Pred. No. 1.2e-31;
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51.5%; Pred. No. 8.8e-34;
Live 37; Mismatches .56
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# GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.

OM protein - protein search, using sw model

May 30, 2003, 12:08:59 ; Search time 24 Seconds (without alignments) 1062.831 Million cell updates/sec Run on:

US-09-898-165B-7 3271 1 MSGIKKQKTENQQKSTNVVÝ......MAPKAWKVLTDXYRSEMDKN 615 Title: Perfect score: Sequence:

Scoring table:

112892 segs, 41476328 residues BLOSUM62 Gapop 10.0 , Gapext 0?5

Searched:

112892 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

SwissProt\_40:\* Database : Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

### SUMMARIES

Description	095340 h bifunctio	28 m	E	ב									Q43295 arabidopsis		Q9kp21 vibrio chol	E	ы	bacillu	r nodq	P72339 r nodq bifu			Q9k7h6 bacillus ha	×	ø			_	P78937 schizosacch	0	1	52	006736 bacillus su
SOMMANIES	PPS2_HUMAN	PPS2_MOUSE	PPS1_MOUSE	PPS1_HUMAN	PPS1_CAVPO	KAPS_EMENI	KAPS_YEAST	KAPS_PENCH	CYC2_BACSU	KAP2_ARATH	CYC1_BACHD	CYSC_ECOLI	KAP1_ARATH	KAPS_CATRO	CYSC_VIBCH	CYSN_MYCTU	NODQ_RHISB	CYC1_BACSU	NODQ_RHITR	NODQ_RHIS3	NODQ_RHIME	CYSC_BUCAI	CYC2_BACHD	CYSN_XYLFA	SATC_AQUAE	NODQ_AZOBR	CYC1_PSEAE	SAT_DEIRA	MET3_SCHPO		CYC2_PSEAE		SAT2_BACSU
Ä		621							199	293	202		276	312							641	506	208	623	546	620		387	490	177		574	
% Ou core Ma	236.5 98	985.5 91.3	79	79	2563 78	16	523 16	16	00 15	15	14	14	. 14	14	463 14.	14	13	13	51 13	49 13	436 13	13	429 13.	13	12	12	407 12	12	397 12.1	12	11	74 1	371.5 11.4
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066036 chromatium P74241 synechocyst	P56861 deinococcus Q12650 penicillium	034764 bacillus su 09y872 candida alb	Q9ycr6 aeropyrum p P08536 saccharomyc	076156 entamoeba h P56863 pyrococcus	P56862 aspergillus Q9ycr4 aeropyrum p
SAT_CHRVI SAT_SYNY3	CYSC_DEIRA MET3_PENCH	SAT1_BACSU MET3_CANAL	CYSC_AERPE MET3_YEAST	SAT_ENTHI	MET3_ASPTE SAT_AERPE
			<b>-</b> г -і		пп
397	192 572	382	186 521	423	568 389
11.1	11.1 10.8	10.7	10.5	10.4	10.2
364.5	362 352.5	351.5	344.5	340.5	333.5
34 35	36 37	38 30 30	40	4 4 3 8	44

## ALIGNMENTS

[5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-LIVEF; MEDITALIZED:
Biochem. Biophys. Res. Commun. [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver;
Biochem. Biophys. Res. [5] SEQUENCE FROM N.A. (15] TISSUE-LIVET, MENTARY-OFFICE.
PAPSS2: gene cloning, Biochem. Biophys. Res. [5] SEQUENCE FROM N.A. (IS TISSUBELIVER:
Human 3 - prospinadenosine 3 - prospinosulate synthetase 1 (PAESSI) PAPSS2 gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver;
"Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Livery. TISSUE-Livery.
Weinsminson Town K.M.; Weinsminson 10-00m K.M.
Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver;
Mitchell S., Moon E., Weinshilboum R.M.; "Human 3' phosphoadenc PAPSS2: gene cloning, Biochem. Biophys. Res. [5] SEQUENCE FROM N.A. (IS TISSUELLIVET; MENTINE-JOACSEL, DANN
Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Weinshilboum R.M.; Human 3 -phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene oloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE PROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver;
Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-LIYER: TISSUE-LIYER: TISSUE-LIYER:
Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Wood T.C., Witchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Weinshilboum R.M.; Weinshilboum R.M.; Phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Blochem. Blophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Liver;  TISSUE-Liver;
MEDLINE-20145452; PubMed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Xu ZH., Otterness D.M., Freimuth R.R., Mitchell S., Woon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-LIVER: TISSUE-LIVER:
MEDLINE-20145452; Pubmed-1067923; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver; TISSUE-Liver;
SEQUENCE FROM N.A. (ISOPCRM A).  MEDLINE-20143452; Pubmed=10679223;  Xu ZH. Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Liver;  TISSUE-Liver;  TISSUE-Liver;
SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-2014542; Pubmed=10679223; MEDIINE-2014542; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOFORM A). MEDIJNE-20145452; PubMed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver; TISSUE-Liver;
SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679233; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; Welnshilboum R.M.; Whunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Blochem. Blophys. Res. Commun. 268.437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer;
Subjusted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20145451; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.; Weinshilboum R.M.; "Human 3'-phosphoadencher phosphosulfate synthetase 1 (PAPSS1) PAPS2: gene ofloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver; TISSUE-Liver;
Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver; TISSUE-Liver; TISSUE-Liver;
activity. '; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; PubMed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.; Weinshilboum R.M.; Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Blochem. Blophys. Res. Commun. 268:437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20145451; Watchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Weinshilboum R.M.; Wennshilboum R.M.; Wennshilboum R.M.; Wennshilboum R.M.; SADORONE FROM N.A. (ISOFORM B). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
dilterential expression of isotorms and effect of polymorphisms on activity.";  Submitter (CT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SUBMICE FROM N.A. (ISOFORM A).  MEDLINE-20145452; Pubmed=10679223;  Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Hunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  [5]  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  MEDLINE-20145452; Pubmed=10679223;  Xu ZH., Otterness D.M., Fredmuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.;  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biochem. SeQUENCE FROM N.A. (ISOFORM B).  TISSUE-Linyer;  TISSUE-Linyer;  TISSUE-Linyer;
"Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4] SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.: "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likber; TISSUE-Likber; TISSUE-Likber;
"Human bifunctional 3'-robosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SCOUENCE FROM NA. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH. Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; Welnshilboum R.M.; Welnshilboum R.M.; Welnshilboum R.M.; Welnshilboum R.M.; Scouence cloning, characterization and chromosomal localization Blochem. Blophys. Res. Commun. 268:437-444(2000).  [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer;
Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Fredmuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer;
Fuda H., Shimizu C., Strott C.A.; "Human blitunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20145452; MEDIINE-20145452; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene olloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver: TISSUE-Liv
SEQUENCE FROM N.A. (150FORM A).  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  MEDLINE-20145452; Pubmed-10679223;  Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Library: TISSUE
SEQUENCE FROM N.A. (ISOPORM A). Funda H., Shimizu C., Strott C.A.; Hunan bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOPORM A). MEDLINE-20143452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.; Weinshilboum R.M.; Hunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer;
Fuda H., Shimizu C., Strott C.A.; Thuman bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: aliferential expression of isoforms and effect of polymorphisms on activity."; Submitted (ocT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). Melbine-20145452; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver:
[13] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; Fuda H., Shimizu C., Strott C.A.; Ruman bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity. Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. Submitted (OCT-2014542; Pubmed-1067923; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver; TISSUE-Liver;
SEQUENCE FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  SEQUENCE FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  MEDLINE-20145452; Pubmed=10679223;  Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  [5]  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Liver:  TISSUE
SUBJULCTER (JOBN 1990) TO THE EMBLY DEBLIANDED GALGERSS.)  SEQUENCE FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  MEDLINE-20145452; Pubmed=10679223;  Xu ZH., Otterness D.M., Freamuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  [5]  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Liver:  TISSUE-Liv
Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.    Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.    SEQUENCE FROM N.A. (ISOFORM A).   Fuda H., Shimizu C., Strott C.A.;   Strott Construct C.A.;   Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.   Construct Construct C.A.;   Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.   Construct Construct C.A.;   SEQUENCE FROM N.A. (ISOFORM A).   Mainshilboum R.M.;   Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)   PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biochem. Biophys. Res. Commun. 268:437-444(2000).   SEQUENCE FROM N.A. (ISOFORM B).   TISSUE-Liver:   TISSUE-Liver:
Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  SQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  MEDIINE-2014542;  Nu ZH., Otterness D.M., Fredmuth R.R., Carlini E.J., Wood T.C., Meinshilboum R.M.;  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Likyer;  TISSUE-Likyer;
Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [13] [13] [14] [15] [15] [16] [17] [18] [18] [18] [18] [19] [19] [19] [19] [19] [19] [19] [19
Subjucted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  [4] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likery:
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; Welnshilboum R.M.; Welnshilboum R.M.; Welnshilboum R.M.; Welnshilboum R.M.; SEGUENCE FROM N.A. (ISOFORM B). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likrer; TISSUE-Likrer; TISSUE-Likrer; TISSUE-Likrer; TISSUE-Likrer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Funda H., Shimizu. C., Strott C.A.; Funda H., Shimizu. C., Strott C.A.; Funda H., Shimizu. C., Strott C.A.; Funda H., Shimizu. C., Strott EMBL/GenBank/DDBJ databases differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SCHOENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Hunan 3'-Phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. ElsoBelline EROM N.A. (ISOFORM B). TISSUE-Line PROPERSE NOT SERVER B).
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; Fuda H., Shimizu C., Strott C.A.; Thuman bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: "Indifferential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISOWE-Likyer; TISOWE-Likyer; TISOWE-Likyer;
Figure N. V. L., Gibson M.A., Hatzinikolas G., Cleary E.C., Wooldte E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  [4]  Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  MEDING-20164542; Pubmed-10679223;  MEDING-20164542; Pubmed-10679223;  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSSI: Gene Cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Subnitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  [4] Mitchell COCT-2000) to the EMBL/GenBank/DDBJ databases.  [5] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A). Funda H., Shimizu C., Strott C.A.). Funda H., Shimizu C., Strott C.A.). Funda Differential expression of isoforms and effect of polymorphisms on activity.  [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4] SCHOENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welinshilboum R.M.; Hunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  FISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu. C., Strott C.A.; Fuda H., Shimizu. C., Strott C.A.; Fuda H., Shimizu. C., Strott C.A.; Fuda H., Sidmizu C., Strott C.A.; Fuda H., Sidmizu and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SCHOENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freamuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
SUDGENCE FROM NA. (1505 OWA A).  Stanton V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.;  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  SEQUENCE FROM N.A. (1505 ORA A).  Fuda H., Shimizu C., Strott C.A.;  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SUBMITTED 20145452;  FUDA 1., SOFORM A).  MEDLINE-20145452;  FUDA 1., Noon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
SUDGENCE FYON N. S. (1SOFORM A).  SUDGENCE FYON N. A. (1SOFORM A).  Sutherland G.R.;  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  SEQUENCE FROM N.A. (1SOFORM A).  Fuda H., Shimizu C., Strott C.A.;  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  MEDLINE-20145452; Pubmed=16079223;  MEDLINE-20145452; Pubmed=16079223;  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A).  SEDIENCE FROM N.A. (ISOPORM A).  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase:  differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Meinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISOBE-Likery.  TISOBCE-Likery.  TISOBC
SEQUENCE FROM N.A. (ISOPORM A). Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H., Shimizu C., Strott C.A.; Mifferential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Meinshibboum R.M., Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A). Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H., Shimizu C., Strott C.A.; Mifferential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Meinshibboum R.M., Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOFORM A). Francon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] [3] Fuda H., Shimizu C., Strott C.A.; [4] SEQUENCE FROM N.A. (ISOFORM A). Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDINE-20145452; Pubmed=10679223; Maichell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M., Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: Gene Cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A). Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H., Shimizu C., Strott C.A.; Mifferential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Meinshibboum R.M., Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOFORM A). Francon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] [3] Fuda H., Shimizu C., Strott C.A.; [4] SEQUENCE FROM N.A. (ISOFORM A). Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDINE-20145452; Pubmed=10679223; Maichell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M., Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: Gene Cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A). Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H., Shimizu C., Strott C.A.; Mifferential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Meinshibboum R.M., Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A). Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H., Shimizu C., Strott C.A.; Mifferential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Meinshibboum R.M., Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A).  Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Fuda H., Shimizu C., Strott C.A.;  Mifferential expression of isoforms and effect of polymorphisms on activity.";  Scubitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Meinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A).  SEDIENCE FROM N.A. (ISOPORM A).  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase:  differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Meinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISOBE-Likery.  TISOBCE-Likery.  TISOBC
SEQUENCE FROM N.A. (ISOPORM A).  SEDIENCE FROM N.A. (ISOPORM A).  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A).  SEDIENCE FROM N.A. (ISOPORM A).  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
SEQUENCE FROM N.A. (ISOPORM A).  SEDIENCE FROM N.L. (ISOPORM A).  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  SEQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISOBE-Livery.  TISOBE-Li
SUDGENCE FROM N. S. (1SOFORM A).  SUDGENCE FROM N. S. (1SOFORM A).  Sutherland G.R.;  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  SEQUENCE FROM N.A. (1SOFORM A).  Fuda H., Shimizu C., Strott C.A.;  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SUBMITTED 20145452; PubMed=10679223;  Xu ZH., Otterness D.M., Fredmuth R.R., Carlini E.J., Wood T.C.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
SUDGENCE FROM N. S. (1SOFORM A).  SUDGENCE FROM N. S. (1SOFORM A).  Sutherland G.R.;  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  SEQUENCE FROM N.A. (1SOFORM A).  Fuda H., Shimizu C., Strott C.A.;  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SUBMITTED 20145452; PubMed=10679223;  Xu ZH., Otterness D.M., Fredmuth R.R., Carlini E.J., Wood T.C.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
SUDGENCE FROM NA. (1505 OWA A).  Stanton V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.;  Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  SEQUENCE FROM N.A. (1505 ORA A).  Fuda H., Shimizu C., Strott C.A.;  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SUBMITTED 20145452;  FUDA 1., SOFORM A).  MEDLINE-20145452;  FUDA 1., Noon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu. C., Strott C.A.; Fuda H., Shimizu. C., Strott C.A.; Fuda H., Shimizu. C., Strott C.A.; Fuda H., Sidmizu C., Strott C.A.; Fuda H., Sidmizu and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SCHOENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freamuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A). Funda H., Shimizu C., Strott C.A.). Funda H., Shimizu C., Strott C.A.). Funda Differential expression of isoforms and effect of polymorphisms on activity.  [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4] SCHOENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welinshilboum R.M.; Hunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  FISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Frehmuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Subnitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  [4] Mitchell COCT-2000) to the EMBL/GenBank/DDBJ databases.  [5] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Firston V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  [3]  Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase:  [4]  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [5]  SEQUENCE FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  MEDIINE-2014543; Pubmed=10679223;  MEDIINE-2014542; Pubmed=10679223;  MICCHELL S., MOON E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSSI: Gene Cloning, Characterization and Chromosomal localization  Elsothem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Firston V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  [4]  Fuda H., Shimizu C., Strott C.A.;  Milfurchial expression of isoforms and effect of polymorphisms on activity.";  Scource FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSSI: gene cloning, characterization and chromosomal localization biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [5] SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H.; Shimizu C.; Strott C.A.; Fuda H.; Shimizu C.; Strott C.A.; Thuman blitunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Schultted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). Melbink-2014545; Pubmeda-10679223; Mitchell S.; Moon E.; Kim UJ.; Xu JP.; Siciliano M.J.; Weinshilboum R.M.; Hunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Liker;
Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H.; Shimizu C.; Strott C.A.; Fuda H.; Shimizu C.; Strott C.A.; Thuman bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). Medichell S.; Moon E.; Kim UJ.; Xi JP.; Siciliano M.J.; Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20164542; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISOWE-Likyer; TISOWE-Likyer; TISOWE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20164542; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISOWE-Likyer; TISOWE-Likyer; TISOWE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20164542; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISOWE-Likyer; TISOWE-Likyer; TISOWE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20164542; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISOWE-Likyer; TISOWE-Likyer; TISOWE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20164542; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISOWE-Likyer; TISOWE-Likyer; TISOWE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20164542; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISOWE-Likyer; TISOWE-Likyer; TISOWE-Likyer;
Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H.; Shimizu C.; Strott C.A.; Fuda H.; Shimizu C.; Strott C.A.; Thuman bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). Medichell S.; Moon E.; Kim UJ.; Xi JP.; Siciliano M.J.; Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H.; Shimizu C.; Strott C.A.; Fuda H.; Shimizu C.; Strott C.A.; Thuman blitunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Schultted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). Melbink-2014545; Pubmeda-10679223; Mitchell S.; Moon E.; Kim UJ.; Xu JP.; Siciliano M.J.; Weinshilboum R.M.; Hunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Liker;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [5] SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Figure N. V. L., Gibson M.A., Hatzinikolas G., Cleary E.C., Wooldte E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  [4]  Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  MEDING-20164542; Pubmed-10679223;  MEDING-20164542; Pubmed-10679223;  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSSI: Gene Cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Firston V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  [4]  Fuda H., Shimizu C., Strott C.A.;  Milfurchial expression of isoforms and effect of polymorphisms on activity.";  Scource FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSSI: gene cloning, characterization and chromosomal localization biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Firston V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  [3]  Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase:  [4]  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [5]  SEQUENCE FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  MEDIINE-2014543; Pubmed=10679223;  MEDIINE-2014542; Pubmed=10679223;  MICCHELL S., MOON E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSSI: Gene Cloning, Characterization and Chromosomal localization  Elsothem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] [3] [4] [5] [6] [6] [7] [7] [8] [8] [8] [8] [8] [8] [8] [8] [9] [9] [9] [9] [9] [9] [9] [9] [9] [9
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Bubmitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SCOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Bubmitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SCOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] Exportence FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.": "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Scholence FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery.
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] Exportence FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.": "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Scholence FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery.
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] Exportence FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.": "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Scholence FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery.
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] Exportence FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.": "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Scholence FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery.
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] Exportence FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.": "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Scholence FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery.
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] Exportence FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.": "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Scholence FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery.
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] Exportence FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.": "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Scholence FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery.
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Frehmuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Frehmuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Frehmuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Frehmuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] Exportence FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.": "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Scholence FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery. TISOBE-Likery.
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: [4] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEOUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; "Bubmitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SCOUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Subnitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  [4] Mitchell COCT-2000) to the EMBL/GenBank/DDBJ databases.  [5] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Franzon V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] [3] [4] [5] [6] [6] [7] [7] [8] [8] [8] [8] [8] [8] [8] [8] [9] [9] [9] [9] [9] [9] [9] [9] [9] [9
Firston V.L., Gibson M.A., Hatzinikolas G., Cleary E.G., Woolatt E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  [4]  Fuda H., Shimizu C., Strott C.A.;  Milfurchial expression of isoforms and effect of polymorphisms on activity.";  Scource FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSSI: gene cloning, characterization and chromosomal localization biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Figure N. V. L., Gibson M.A., Hatzinikolas G., Cleary E.C., Wooldte E. Sutherland G.R.;  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3]  [4]  Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  SEQUENCE FROM N.A. (ISOFORM A).  MEDING-20164542; Pubmed-10679223;  MEDING-20164542; Pubmed-10679223;  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Weinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI)  PAPSSI: Gene Cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;  TISSUE-Likyer;
Sutherland G.R.; Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Fuda H.; Shimizu C.; Strott C.A.; Fuda H.; Shimizu C.; Strott C.A.; Thuman blitunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Schultted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). Melbink-2014545; Pubmeda-10679223; Mitchell S.; Moon E.; Kim UJ.; Xu JP.; Siciliano M.J.; Weinshilboum R.M.; Hunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Liker;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20164542; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISOWE-Likyer; TISOWE-Likyer; TISOWE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.;  In Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase:  [4] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer; TISSUE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; [4] SUBMITTED (SCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SUBMITTER FROM N.A. (ISOFORM A). MEDLINE-20145452; PubMed=10679223; Xu ZH., Otterness D.M., Fredmuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer;
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Funda H., Shimizu. C., Strott C.A.; Funda H., Shimizu. C., Strott C.A.; Funda H., Shimizu. C., Strott C.A.; Funda H., Shimizu. C., Strott EMBL/GenBank/DDBJ databases differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SCHOENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Hunan 3'-Phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. ElsoBelline EROM N.A. (ISOFORM B). TISSUE-Line PROPERSE NOT SERVER B).
Sutherland G.R.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). Funda H., Shimizu C., Strott C.A.; Funda H., Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Welinshilboum R.M.; Welinshilboum R.M.; Hunan 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Blochem. Blophys. Res. Commun. 268:437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer;
Sutherland G.K.; Sutherland G.K.; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likyer; TISSUE-Likyer;
Subjucted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  [4] SEQUENCE FROM N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Likery:
Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [3] [3] [4] [5] [6] [6] [7] [7] [8] [8] [8] [8] [8] [8] [8] [8] [9] [9] [9] [9] [9] [9] [9] [9] [9] [9
Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases.  [5] SEQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase:  differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4] SEQUENCE FROM N.A. (ISOFORM A).  SEQUENCE FROM N.A. (ISOFORM A).  Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Meinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization  Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Liver:  TESSUE-Liver:
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SEQUENCE FROM N.A. (ISOPORM A).  SEQUENCE FROM N.A. (ISOPORM A).  SEQUENCE FROM N.A. (ISOPORM A).  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4]  SEQUENCE FROM N.A. (ISOPORM A).  MEDLINE-20145452; Pubmed=10679223;  Xu ZH., Otterness D.M., Freamuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J.,  Melinshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1)  PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  [5]  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Liver:  TISOR-Liver:  TISOR-Li
[3] SEQUENCE FROM N.A. (ISOFORM A). SEGUENCE FROM N.A. (ISOFORM A). FURD H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; SEQUENCE TOWN N.A. (ISOFORM A). SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver; TISSUE-Liver;
[6]  EQUENCE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases.  [4]  EQUENCE FROM N.A. (ISOFORM A).  MEDLINE-20145452; Pubmed-10679223;  Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Mitchell S., Phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  ESGUENCE FROM N.A. (ISOFORM B).  TISSUE-Liver;  TISSUE-Liver;  TISSUE-Liver;  TISSUE-Liver;  TISSUE-Liver;
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Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20145452; Whitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver: TISSUE-Liver
SEQUENCE FROM N.A. (ISOFORM A). Fuda H., Shimizu C., Strott C.A.; Fuda H., Shimizu C., Strott C.A.; Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDIINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Fredmuth R.R., Carlini E.J., Wood T.C., Weinshilboum R.M.; Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver: TISSUE-Liv
SEGUENCE FROM N.A. (ISOFORM A). Fuda H., Shimiau. C., Strott C.A.; Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SUBMITTED 20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freamuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Weinshilboum R.M.; Weinshilboum R.M.; Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268:437-444(2000). TISSUE-Liver; TISSUE-Liver; TISSUE-Liver; TISSUE-Liver; TISSUE-Liver;
SEQUENCE FROM N.A. (ISOPORM A). Fuda H., Shimizu C., Strott C.A.; "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] SEQUENCE FROM N.A. (ISOFORM A). MEDLINE-20145452; Pubmed=10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Melnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Blophys. Res. Commun. 268.437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Liver: TISSUE-Liver:
SEQUENCE FROM N.A. (ISOPORM A).  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity."; Submitted (OCT-2000) to the EMBL/GenBank/DDBJ databases. [4] Stourner FROM N.A. (ISOFORM A).  MEDLINE-20145452; PubMed-10679223; Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.; "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000). [5] SEQUENCE FROM N.A. (ISOFORM B). TISSUE-Library. TISSUE-Library. TISSUE-Library.
SEQUENCE FROM N.A. (ISOFORM A).  SEUGRACE FROM N.A. (ISOFORM A).  Fuda H., Shimizu C., Strott C.A.;  "Human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase: differential expression of isoforms and effect of polymorphisms on activity.";  SEDUBLICE FROM N.A. (ISOFORM A).  SEDUBLICE FROM N.A. (ISOFORM A).  MEDLINE-20145452; Pubmed-10679223;  Xu ZH., Otterness D.M., Freimuth R.R., Carlini E.J., Wood T.C., Mitchell S., Moon E., Kim UJ., Xu JP., Siciliano M.J., Welnshilboum R.M.;  "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSSI) PAPSS2: gene cloning, characterization and chromosomal localization Biochem. Biophys. Res. Commun. 268.437-444(2000).  SEQUENCE FROM N.A. (ISOFORM B).  TISSUE-Liver;  TISSUE-Liver;  TISSUE-Liver;

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Submitted (JUL-2001) to the EMBL/GenBank/DDBJ databases.

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CI-FUNCTION: BIFUNCTIONAL ENZYME WITH BOTH ATP SULFWITEAEE

KINASE ACTIVITY, WHICH MEDIATES TWO STEPS IN THE SULFATE

ACTIVATION PATHWAY. THE FIRST STEP IS THE TRANSFER OF A SULFATE

GROUP TO AIP TO YIELLA ADENOSINE 5'-PHOSPHATE GROUP FROM ATP TO ARE

SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO ARE

SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO ARE

SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO ARE

SECOND STEP IS THE TRANSFER OF A PHOSPHATE SULFATE DONOR

USED BY SULFOTRANSFERASE): IN MAMMALS, PARS IS THE SULFATE DONOR

SULFATE; APS APPEARS TO BE ONLY AN INTERMEDIATE IN THE SULFATE-

CONTACT OF ALTHURY: ATP HOSPHATE A IMPORTANT ROLE IN SKELETOGENESIS

CONTACT OF ALTHURY: ATP HOSPHATE A BORDALY SULFATE-

COTALLY OF A SULFATE AND A SULFATE A BORDALY SULFATE-

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PATHWAY: BELONGS TO THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BLOSKINILATION PATHWAY: TO THE SULFATION OF PROTEINS, AND TO THE SULFATION OF PROTEINS, CARBOHYDARIES, LIPIDS, DRUGS AND XENOBIOTICS.

ALTERNATIVE PRODUCTS: 2 isoforms; a (shown here) and b; are produced by alternative splicing.

TISSUE SPECIFICITY: EXPRESSED IN CARTILAGE.

DISEASE: DEFECTS IN PAPSS2 ARE THE CAUSE OF SPONDYLOEPIMETAPHYSEAL DYSPLASTA ANKISTANI TYPE (SEMD), AN AUTOSCMAL RECESSIVE DISEASE. PRIMARILY EPIPHYSEAL WITH ONLY MILD METAPHYSEAL ABNORMALITIES.

SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE APS KINASE
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sulfurylase/adenosine 5'-phosphosulfate kinase isoform SK2.";
J. Biol. Chem. 274:33306-33312(1999).
                                                                                                    SEQUENCE FROM N.A. (ISOFORM B)...
Venkatachalam K.V., Fuda H., Strott C.A.;
13. Thosphoadenosine 5'-phosphoadenosine 5'-phosphoadenosine 5'-phosphoadenosine 5'-bhosphoadenosine 5'-bhosph
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Interpro; IPR002650; ATP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ProDom; PD002350; APS_kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOINED.
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                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A. (ISOFORM A).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; AF091242; AAC64583.1; -.
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AF160505; AAF40307.2; J
AF160506; AAF40307.2; J
AF160507; AAF40307.2; J
AF10508; AAF40307.2; J
AF173365; AAF12761.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; AF150754; AAF20366.2;
EMBL; BC009894; AAH09894.1;
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                                                                                                                                                                                                                                                                                                                 IISSUE-Colon;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MIM; 603005
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGHAL 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAP 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKMVM 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAI 480
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088428; 092427;
30-MAY-2000 (Rel. 39, Last sequence update)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
16-OCT-2010 (Rel. 40, Last annotation update)
16-OCT-3010 (SR 2)
110-11 (SR 2) (Sulfurylase kinase 2) (SR 2)
110-11 (APP-3011 (APP-301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121 FISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVRAE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 MSGIKKOKTENQOKSTNVVYQAHHVSRNKRGOVVGTRGGFRGCTVWLTGLSGAGKTTISF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61 ALEEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FORMS THE PHOSPHOSERINE INTERMEDIATE (B'
SIMILARITY).
PP-MOTIF (BY SIMILARITY).
D -> DGMALP (IN ISOFORM B).
R -> K (IN REF. 2).
E -> G (IN REF. 3).
R -> C (IN REF. 1).
P -> L (IN REF. 1).
W#, 52F486D972DDA91E CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                Score 3236.5; DB 1; Length 614;
Pred. No. 1.2e-225;
2; Mismatches 1; Indels 1;
SULFATE ADENYLYLTRANSFERASE
                                  (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                 69500 MW;
                                                                                                                                                                                                                                                                                                                                                                                                   98.98;
99.38;
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                                                                                                                                 515
288
166
361
426
567
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                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
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ACT_SITE
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CONFLICT
CONFLICT
SEQUENCE
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CONFLICT
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Best Local
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TOTALDING THE DESCRIPTION PATH AND THE SULFATE

ACTIVATION: BIFUNCTIONAL ENZYME WITH BOTH ATP SULFURYLASE AND APS

C. FUNCTION: BIFUNCTIONAL ENZYME WITH BOTH ATP SULFURIES

C. KINASE ACTIVITY, WHICH MEDIATES TWO STREPS IN THE SULFATE

ACTIVATION PATHWAY. THE FIRST STEP IS THE TRANSFER OF A SULFATE

GROUP TO ATP TO YIELD ADENOSINE 5'-PHOSPHOSULRYME (ARS), AND THE

SECOND STEP IS THE TRANSFER OF A PHOSPHOATE GROUP FROM ATP TO ARS

YIELDING 3'-PHOSPHOADENYLYLSULFATE (PARS: ACTIVATED SULFATE DONOR

USED BY SULFOTRANSFERASE). IN MAMMALS, PARS IS THE SOLE SOURCE OF

SULFATE, ABS APPEARS TO BE ONLY AN INTERNEDIATE IN THE SULFATE-

C. ACTIVATION PATHWAY. MAY HAVE A IMPORTANT ROLE IN SKELETOGENESIS

DURING POSTNATAL GROWTH.

C. TOTALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate.

PATHWAY: BELOGNES TO THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO

THE BIOSYNTHESIS OF CYSTEINE AND METHIONINE, AND TO THE SULFATION

OF PROTEINS, CARROHYDRATES, LIPIDS, DRUGS AND XENDBROTHS.

C. TOTALS SECULTIVE: EXPRESSED IN LIVER, CARTILAGE, SKIN AND BRAIN.

C. TISSUE SPECIFICITY: EXPRESSED IN LIVER, CARTILAGE, SKIN AND BRAIN.

C. TOTALS SHOWE SHEET ASSIMILATION PROPARACTERIZED BY ABNORMAL

AUTOSOWAL RECESSIVE DISEASE, WHICH IS CHARACTERIZED BY ABNORMAL

C. DISEASE: DEFECTS IN PAPSS2 ARE THE CAUSE OF BRACHYMORPHISM (BM), A

AUTOSOWAL RECESSIVE DISEASE, WHICH IS CHARACTERIZED BY ABNORMAL

C. DISEASE: THE ABNORMAL SCONDENCY.

C. DISEASE: THE ABNORMAL CROWTH HAS BEEN ATTRIBUTED

C. DISEASE: THE ABNORMAL BOOSTWARL GROWTH, SUCH AND ADDROVED.

C. DISEASE SHEER DESCRIBED PROPERSIONAL RECESSIVE AND ADDROVED.

C. DISEASE SHEER DESCRIBE PROPERSIONAL RECESSIVE DISEASE WHICH AS BEEN ATTRIBUTED.

C. DISEASE SHEER DESCRIBE PROPERSIONAL RESERVANCE.

C. DISEASE SHEER DESCRIBE PROPERSIONAL RESERVANCE.

C. DISEASE SHEER DESCRIBE DISEASE AND CONTROLLS.

C. DISEASE SHEER DESCRIBED BUT NOT THE SULFACE.

C. DISEASE SHEER DESCRIBED BUT NOT THE SULFACE.

C. DISEASE SHEER DESCRIBED BUT NOT THE SULFACE.

C. DISEASE SHEER DESCRIBED BUT NOT THE SULFACE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  this SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                      'A member of a new family of sulfate activating enzymes causes murine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE-98442651; PubMed-9771708; Ul Haque M.F., King L.M., Cantor R.M., Rusiniak M.E., Swank R.T., Superti-Furga A., Haque S., Abbas H., Ahmad W., Ahmad M., Cohn D.H.; "Mutations in orthologous genes in human spondyloepimetaphyseal dysplasia and the brachymorphic mouse.";
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TIGRFAMS; TIGRO0455; apsK; 1.
Transferase; Nucleotidyltransferase; Kinase; Multifunctional enzyme;
ATP-binding; Multigene family; Disease mutation; Polymorphism.
                                                                                                                                                                                                                                                                                                                   Kurima K., Warman M.L., Krishnan S., Domowicz M., Krueger R.C. Jr.,
Deyrup A., Schwartz N.B.;
                                                                                                                Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE SULFATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A., VARIANT BM ARG-79, AND VARIANT LYS-109.
STRAIN=PWK; TISSUE-Spleen;
(Adenosine-5'-phosphosulfate 3'-phosphotransferase) (3'-phosphoadenosine-5'-phosphosulfate synthetase)].
PAPSS2 OR ATPSK2.
                                                                                                                                                                                                                                                                                                                                                                                                                                 Proc. Natl. Acad. Sci. U.S.A. 95:8681-8685(1998).
                                                                                                                                                                                                                                SEQUENCE FROM N.A., AND VARIANT BM ARG-79.
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InterPro; IPR002650; ATP-sulfurylase.
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Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                      MEDLINE=98337975; PubMed=9671738;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ProDom; PD002350; APS_kinase; 1.
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                                                                                           Mus musculus (Mouse).
                                                                                                                                                                                                                                                                                                                                                    Schwartz
                                                                                                                                                                           NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                      brachymorphism."
                                                                                                                                                                                                                                                           TISSUE=Liver;
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246 PSLPITKLDLOWVQILSEGWATPLKGFWREKEYLQTLHFDTLLDGVVPRDGVINMSIPIV 305
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                                                                                                                                                                                                                                                                                                                                                                                                                                                           65 YLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISP 124
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30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
16-OCT-2001 (Sel. 41)
1
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                                                                 FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                      SIMILARITY).
PP-MOTIF (BY SIMILARITY).
G -> R (IN BM; ACTIVITY ABOLISHED).
R -> K.
S :> F (IN REF. 2).
MISSING (IN REF. 2).
W; DB375F06A79EFAAB CRC64;
                                                                                                                                                                                                                                                                                                                      5.
                                                                                                                                                                                                                                                                             DB 1; Length
                                                                                                                                                                                                                                                                                                                         26; Indels
                        SULFATE ADENYLYLTRANSFERASE.
  ADENYLYLSULFATE KINASE
                                                                                                                                                                                                                                                                         Score 2985.5; DB ]
Pred. No. 1.5e-207;
18; Mismatches 26;
                                             ATP (POTENTIAL)
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92.0%;
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621 AA;
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Q60967;
                                             NP_BIND
ACT_SITE
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CONFLICT
CONFLICT
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Best Local
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                                                                                                                                                                                                          THE 1801ALLON and characterization of cDNA encoding the mouse bifunctional ATP sulfurylase-adenosine 5'-phosphosulfate kinase."; J. Biol. Chem. 270:29453-29453(1995).

I. BIOL. Chem. 270:29453-29453(1995).

I. FUNCTION: BIFUNCTIONAL ENZYME MITH BOTH ATP SULFURYLASE AND APS KINASE ACTIVITY, WHICH MEDIATES TWO STEPS IN THE SULFATE ACTIVATION PATHWAY. THE FIRST STEP IS THE TRANSFER OF A SULFATE GROUP TO ATP TO YIELD ADENOSINE 5'-PHOSPHATE GROUP FROM ATP TO APS SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO APS VIELDING 3'-PHOSPHOADENYLKISULFATE (PAPS: ACTIVATED SULFATE DONOR SULFATE; APS APPEARS TO BE ONLY AN INTERMEDIATE IN THE SULFATE ACTIVATION PATHWAY. ALSO INVOLVED IN THE BIOSYNTHESIS OF SULFATED ASSENCED.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate. CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                Li H., Deyrup A., Mensch J.R. Jr., Domowicz M., Konstantinidis A.K.,
Schwartz N.B.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TIGREAMS; TIGRO0455; apsK; 1.
Transferase; Nucleotidyltransferase; Kinase; Multifunctional enzyme;
                                                             Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE SULFATE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADENYLYLSULFATE KINASE.
SULFATE ADENYLYLTRANSFERASE.
(Adenosine-5'-phosphosulfate 3'-phosphotransferase) (3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        69;
                 phosphoadenosine-5'-phosphosulfate synthetase)]
PAPSS1 OR PAPSS OR ASAPK OR ATPSK1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (POTENTIAL)
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InterPro; IPR002650; APP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ProDom; PD002350; APS_kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
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                                                                                                                                                                MEDLINE-96094345; PubMed-7493984;
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Matches 471; Conservative
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                                                 musculus (Mouse).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       624 AA;
                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                 NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Transferase;
ATP-binding;
                                                                                                                                               TISSUE-Brain
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5 KKQKTEN-----QQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTI 58

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DSEYEKPEAPELVLKTDSCDVNDCVQQVVELLQERDIVPVDASYEVKELYVPENKLHLAK 248
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PPS1_HUMAN STANDARD; PRT; 624 AA.

30-MAY-2000 (Rel. 39, Created)

30-MAY-2000 (Rel. 39, Last sequence update)

15-JUN-2002 (Rel. 41, Last annotation update)

16-JUN-2002 (Rel. 41, Last annotation update)

17-JUN-2002 (Rel. 41, Last annotation update)

18-JUN-2002 (Rel. 4
                                                                                                                                                                                                                                                                                                                                                                                                                         SFALEEY LVSHA I PCYSLDGDNVRHGLNRNLGFSPGDREEN I RRI A EVAKLFADAGLVCI
                                 TSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGI
                                                                                                                                                               DSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVR
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Girard J.-P., Baekkevold E.S., Amalric F.;
Sulfation in high endothelialvenules: cloning and
human PAPS synthetase.";
FASEB J. 12:603-612(1998).
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MEDLINE-98334672; Pubmed-9668121;
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KAWTVLVEYYKS 620
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KINASE ACTIVITY, WHICH MEDIATES TWO STEPS IN THE SULEATE
GROUP TO ATP TO YIELD ADENOSINE 5'-PHOSPHATE GAPS), AND THE
SECOND STEP IS THE TRANSFER OF A SULFATE
GROUP TO ATP TO YIELD ADENOSINE 5'-PHOSPHATE GROUP FROM ATP TO APS
YIELDING 3'-PHOSPHOADBNYLYLSULFATE (PAPS: ACTIVATED SULFATE DONOR
USED BY SULFOTRENSFERASE). IN MAMMALS, PAPS IS THE SOLE SOURCE OF
SULFATE, APS APPEARS TO BE ONLY AN INTERMEDIATE IN THE SULFATE-
L-SELECTIN LIGANDS IN ENDOTHELIAL CELLS.
CATALYTIC ACTIVITY: ATP + SULFATE = diphosphate + adenylylsulfate.
CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylylsulfate.
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BEXYME REGULATION: INHIBITED BY CHORATE.

PATHWAY: BELONGS TO THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF CYSTEINE AND METHIONINE, AND TO THE SULFATION OF PROTEINS, CARBOHYDRATES, LIPIDS, DRUGS AND XENOBIOTICS.

TISSUE SPECIFICITY: EXPRESSED IN TESTIS, PANCKERS, KIDNEY, THYMUS, PROSTATE, OVARY, SMALL INTESTINE, COLON, LEUKOCYTES AND LIVER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIMILARITY: IN THE N-TERMINAL SECTION; BELONGS TO THE APS KINASE
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Probom; PD002351; ATP-sulfurylase; 1.
TIGRPAMs; TIGR00455; apsK; 1.
Transferase; Nucleotidyltransferase; Kinase; Multifunctional enzyme; ATP-binding; Multigene family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-99115594; PubMed-9915785;
Venkatachalam K.V., Fuda H., Koonin E.V., Strott C.A.;
Venkatachalam K.V., Fuda H., Koonin E.V., Strott C.A.;
Site-selected mutagenesis of a conserved nucleotide binding HXGH motif located in the ATP sulfurylase domain of human bifunctional 31-phosphoadenosine 5-phosphosulfate synthase.";
J. Biol. Chem. 274:2601-2604(1999).
--- FUNCTION: BIFUNCTIONAL ENZYME WITH BOTH ATP SULFURYLASE AND APS
Venkatachalam K.V., Akita H., Strott C.A.; "Molecular cloning, expression, and characterization of human bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase and its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ALSO EXPRESSED IN HIGH ENDOTHELIAL VENULES (HEV) CELLS AND IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE SULFATE
                                                                                                                                                                                                                                                                                                      Yanagisawa K., Sakakibara Y., Suiko M., Takami Y., Nakayama T., Nakajima H., Takayanagi K., Natori Y., Liu M.-C., "cDNA cloning, expression, and characterization of the human bifunctional ATP sulfurylase/adenosine 5'-phosphosulfate kinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADENYLYLSULFATE KINASE.
SULFATE ADENYLYLTRANSFERASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MUTAGENESIS OF HIS-151; ASN-426; GLY-427 AND HIS-428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Biosci. Biotechnol. Biochem. 62:1037-1040(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro; IPR002891; APS_kinase.
InterPro; IPR002650; APP-Sulfurylase.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                        Biol. Chem. 273:19311-19320(1998).
                                                                                                                                                                                                                                                                         MEDLINE=98312048; PubMed=9648242;
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                                                                                                        functional domains
                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CARTILAGE
                                                                                                                                                                                                                                             TISSUE=Brain;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                          enzyme."
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       HINGS OF STREET STREET
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30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Bifunctional 3 -phosphoadenosine 5'-phosphosulfate synthethase 1 (PAPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             synthethase 1) (PAPSS 1) (Sulfurylase kinase 1) (SK1) (SK 1) [Includes: Sulfate adenylyltransferase (EC 2.7.7.4) (Sulfate adenylate
                                                                                                                                                                                                                                                                                                                                                                                               VLPVSAEDKTRLEGCSKF:VLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPH1KM
                                                                                                                                                                                     5 KKQKTEN-----QQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLJGLSGAGKTTI°
                                                                                                                                                                                                DSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVR
                                                                                                                                                                                                                                                                                                                         239 AEAETLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLDDGVINMSIPI
                                                                                                                                                                                                                                                                                                                                                                  AIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSM
                                                                                                                                                                                                                                                                       TSF1SPFAKDRENARK1HESAGLPFFE1FVDAPLN1CESRDVKGLYKRARAGE1KGFTG1
                                                                                                                                                                                                                                                                                                                                                                                                                                        VMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                           VMEQGDWLIGGDLQVLDRVYWNDGLDQYRLTPTELKQKFKDMNADAVFAFQLRNPVHNGH
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         PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                Gaps
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                                              N-X: INCREASED ACTIVITY.
G-A: 30% DECREASE IN ACTIVITY.
H-AA: LOSS OF ACTIVITY.
CH-AA: LOSS OF ACTIVITY.
L -> F (IN REF. 2).
MISSING (IN REF. 2 AND 3).
                                                                                                                                             624;
                                                                                                                                                                Indels
                                                                                                                                             Length
   FORMS THE FLUCTORY SIMILARITY).
PP-MOTIF (BY SIMILARITY).
H->A: LOSS OF ACTIVITY.
TOPRASED ACTIVITY.
                                                                                                              -> L (IN REF. 2).
6BC4F9648016CA31 CRC64;
                                                                                                                                           79.4%; Score 2596; DB 1; 77.0%; Pred. No. 1.8e-179; ive 67; Mismatches 68;
 ATP (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 624 AA.
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                                                                                                                        70847 MW;
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587
624 AA;
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054820;
NP_BIND
ACT_SITE
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CONFLICT
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CONFLICT
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                                      MUTAGEN
MUTAGEN
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MUTAGEN
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Matches 47
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                             SITE
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Aspergillus nidulans.";
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13 QKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSHAIP 72
                                                                                                                                                                                                                                                                                                                                                                                     PATHWAY: BELONGS TO THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF CYSTEINE AND METHIONINE, AND TO THE SULFATION OF PROTEINS, CARBOHYDRATES, LIPIDS, DRUGS AND XENOBIOTICS. SIMILARITY: IN THE NTERMINAL SECTION; BELONGS TO THE APS KINASE
                                                                                                                                                                                                                                                     SECOND STEP IS THE TRANSFER OF A PHOSPHATE GROUP FROM ATP TO APE Y IELDING 3 - PHOSPHADENXILSULFATE (RAPE: ACTIVATED SULFATE DONOR USED BY SULFOTRENSFERASE). IN MAMMALS, PAPE IS THE SOLE SOURCE OF SULFATE, APP APPEARS TO BE ONLY AN INTERMEDIATE IN THE SOLE SOURCE OF SULFATION PATHARY. ALSO INVOLVED IN THE BIOSYNHESIS OF SULFATED. IS SELECTIN LIGANDS IN ENDOTHBLIAL CELLS (BY SIMILARITY).

CATALYTIC ACTIVITY: ATP + sulfate = diphosphate + adenylysulfate.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Venkatachalam K.V., Akita H., Strott C.A.;
Submitted (MAY-1997) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: BIFUNCTIONAL ENEXME WITH BOTH ATP SULEURIASE AND APS
KINASE ACTIVITY, WHICH MEDIATES TWO STEPS IN THE SULFATE
ACTIVATION PATHWAY. THE FIRST STEP IS THE TRANSFER OF A SULFATE
GROUP TO ATP TO YIELD ADENOSINE 5'-PHOSPHOSULFATE (APS), AND THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nucleotidyltransferase; Kinase; Multifunctional enzyme;
              (APS kinase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                          SIMILARITY: IN THE C-TERMINAL SECTION; BELONGS TO THE SULFATE ADENYLYLTRANSFERASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FORMS THE PHOSPHOSERINE INTERMEDIATE SIMILARITY).
                                                                                     Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ;
0
                                                                    Cavia porcellus (Guinea pig).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleosto
Mammalia; Eutheria; Rodentia; Hystricognathi; Cavildae; Cavia
 (SAT) (ATP-sulfurylase); Adenylylsulfate kinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              78.4%; Score 2563; DB 1; Length 624; 77.3%; Pred. No. 4.2e-177;
           (EC 2.7.1.25) (Adénylylsulfate 3'-phosphotransferase) (Al
(Adenosine-5'-phosphosulfate 3'-phosphotransferase) (3'-
phosphoadenosine-5'-phosphosulfate synthetase)].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADENYLYLSULFATE KINASE.
SULFATE ADENYLYLTRANSFERASE
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BF7461B4D07F2131 CRC64;
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69; Mismatches
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Interpro; IPR002650; ATP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
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ProDom; PD002381; ATP-sulfurylase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; AF004875; AAC02266.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Multigene family.
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                                                                                                                                                                                                                                                                                                                                                                        phosphoadenylylsulfate.
                                                       OR PAPSS OR ATPSKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   624 AA;
                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                       STRAIN-NIH 2;
Venkatachalam K.V.
                                                                                                                NCBI_TaxID=10141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Transferase;
ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          462;
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NP_BIND
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Matches 46
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g
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between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
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                                                                                                                                                                                                                                                                        312
                                                                                                                                                                                                                                                                                                                                                                                                                                                RKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETPERVL 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             373 VLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGHALLMQDTCRRLLER 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYAGPTE 492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VQWHCRSRMIAGANFYIVGRDPAGMPHPETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRV 552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              553 AAYNKAKKAMDFYDPARHNEFDFISGTRMRKLAREGENPPDGFMAPKAWKVLTDYYRS 610
                                   KTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVRAEAETLPSLSITKL
                                                                                                                                                                        DLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLDDGVINMSIPIVLPVSAEDKTRLEG
                                                                                                                                                                                                                                                                                                                                                                                                             CSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKMVMESGDWLVGGDLQ
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-!- PATHWAY: SECOND STEP IN THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF METHIONINE AND CYSTEINE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        30-MAY-2000 (Rel. 39, Last annotation update)
Adenylylsulfate kinase (EC 2.7.1.25) (APS kinase) (Adenosine-
5'phosphosulfate kinase) (ATP adenosine-5'-phosphosulfate 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Fungi; Ascomycota; Pezizomycotina; Eurotiômycetes;
Eurotiales; Trichocomaceae; Emericella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SULFATE.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (OCT-1996) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFAT:
-!- CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -! - SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       206 AA
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30-MAY-2000 (Rel. 39, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Emericella nidulans (Aspergillus nidulans).
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Pfam; PF01583; APS_kinase; 1.
ProDom; PD002350; APS_kinase; 1.
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                                                                                                                                                                                                                                                         99; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              phosphotransferase).
                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-ATCC 24791;
FOSTER B.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=5076;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           KAPS_PENCH
Q12657;
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  entities
                                                                                                                                                                                                            SEQUENCE
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                                                                                                                                                                                                                                              135 IHE-----SAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETP 188
                                                                                                                                                             26
                                                                                                                                       STNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSHAIPCY
                                                                                                                                                     SLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRENARK
                                              (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Duesterhoeft A., Philippsen P.; "DNA sequencing and analysis of a 24.7 kb segment encompassing centromere CEN11 of Saccharomyces cerevisiae reveals nine previously
                                                                                                                   Gaps
                                             FORMS THE PHOSPHOSERINE INTERMEDIATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Korch C., Mountain H.A., Bystroem A.S.;
"Cloning, nucleotide sequence, and regulation of MET14, the gene
encoding the APS kinase of Saccharomyces cerevisiae.";
Mol. Gen. Genet. 229:96-108(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Saccharomyces cerevisiae (Baker's yeast).
Eukaryota; Fungi; Ascomycota; Saccharomycotina; Saccharomycetes;
Saccharomycetales; Saccharomycetaceae; Saccharomyces.
                                                                                                                 11;
                                                                                           Length 206;
                                                                                                                                                                                                                                                                                                                                                                                  01-JUL-1993 (Rel. 26, Created)
01-JUL-1993 (Rel. 26, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
Adenyly1sulfate kinase (EC 2.7.1.25) (APS kinase) (Adenosine-5'phosphosulfate kinase) (ATP adenosine-5'-phosphosulfate 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -!- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
-!- CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                               16.2%; Score 529.5; DB 1; Lenyun. 51.4%; Pred. No. 2.9e-31; ... wismatches 57; Indels
           Cysteine biosynthesis; ATP-binding;
                                                          SIMILARITY).
6AADD483E2BCAICD CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -!- SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                   ATP (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                202 AA
                                                                                                                                                                                                                                                                               ERVLKTNLSTVSDCVHQVVELLQEQNIV 216
                                                                                                                                                                                                                                                                                              | :| :: | ::: | ::: | EVHVKNVDLPIQEAVKQIIDYLDSKKLL 204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=91375456; PubMed=1654509;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=93070612; PubMed=1441752;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            unknown open reading frames.";
Yeast 8:749-759(1992).
                                                                    23028 MW;
TIGRFAMS; TIGR00455; apsK; 1.
                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                 38
             Transferase; Kinase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 phosphotransferase).
                                                                    206 AA;
                                                                                                   Best Local Similarity
Matches 107; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                           MET14 OR YKL001C
                                   31
105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=4932;
                       Phosphorylation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-S288c;
                                                                                                                                                                                                                                                                                                                                                                KAPS_YEAST
Q02196;
                                              ACT_SITE
                                                                                                                                                                                     75
                                                                                                                                                                                                                                                                               189
                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                          Query Match
                                  NP BIND
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(See http://www.isb-sib.ch/announce/
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    102 RIAEVAKLFADAGLVCITSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVK 161
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FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          162 GLYKRARAGEIKGFTGIDSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIV 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Penicillium chrysogenum.
Eukaryota; Fungi; Ascomycota; Pezizomycotina; Eurotiomycetes;
Eurotiales; Trichocomaceae; mitosporic Trichocomaceae; Penicillium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -!- PATHWAY: SECOND STEP IN THE SULFATE ASSIMILATION PATHWAY THAT LEADS TO THE BIOSYNTHESIS OF METHIONINE AND CYSTEINE.
                                                                                      R EMBL; X57990; CAA41055.1; -.
R EMBL; S55115; AAB19854.1; -.
R EMBL; S55124; CAA46252.1; -.
R EMBL; Z28001; CAA46252.1; -.
R EMBL; S17244; S17244.
R SGD; S0001484; MET14.
R InterPro; IPR002891; APS_Kinase.
R Probom; P001285; APS_Kinase; 1.
R Probom; P001285; APS_Kinase; 1.
R TIGRFAMS; TIGR0455; apsK; 1.
M Mcthionine blosynthesis; Cysteine biosynthesis; Transferase; M Kinase; ATP-binding; Phosphorylation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
40-MAY-2010 (Rel. 39, Last annotation update)
50-Mosphosulfate kinase (EC 2.7.1.25) (APS kinase) (Adenosine-5'phosphosulfate kinase) (ATP adenosine-5'-phosphosulfate 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (OCT-1995) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
-!- CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 202,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  47; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIMILARITY).
32F301FB6B2F41D3 CRC64;
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8.3e-31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16.0%; Score 523; 56.6%; Pred. No. 8
                                  or send an email to license@isb-sib.ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  202 AA; 23060 MW;
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KAP2_ARATH
049196;
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ACT_SITE
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                                                                                                                                                                                                                                                                                                           KIHESA-----GLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPET 187
                                                                                                                                                                                     STNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLV-SHAIPC 73
                                                                                                                                                                                                               57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINIE-99044035; FURNEL-508-57;

MEDLINIE-90044035; FURNEL-508-57;

MEDLINIE-90044035; FURNEL-508-57;

MEDRINIES R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S., Brourliet S., Bruschl C.V., Caldwell B., Capuano V., Carter N.M., Chol S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A., Denizot F., Devine K.M., Dusterhoft A., Ehrlich S.D., Emmerson P.T., R. Enting K.D., Errington N., Fabret C., Ferrari E., Foulger D., Chim S.Y., Glaser P., Goffeau A., Golightly B.J., Grandi G., Chijta M., Fabret C., Ferrari E., Foulger D., Chim S.Y., Glaser P., Goffeau A., Golightly B.J., Grandi G., Chim S.Y., Glaspi G., Guy B.J., Haga K., Haiech J., Harwood C.R., Henaut A., Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L., Aoris B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Klein C., Robayashi Y., Koetter P., Koningstein G., Krogh S., Kumano M., Kurita K., Lapidus A., Liu H., Masdda S., Mauel C., Medigue C., Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M., Noone D., O'Reilly M., Ogawa K., Ogiwara A., Oudega B., Park S.H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                               30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
Probable adenylylsulfate Kinase (EC 2.7.1.25) (APS Kinase) (Adenosine-5'phosphosulfate kinase) (ATP adenosine-5'-phosphosulfate 3'-
                                                                                                                                                                                                    YSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRENAR
                                                                                                                                                                                                                                                       ATP (POTENTIAL).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-98015416; PubMed-9353932;
Roche B., Autret S., Levine A., Vannier F., Medina N., Seror S.J.;
A Bacillus subtilis chromosome segment at the 100 degrees to 102
degrees position encoding 11 membrane proteins.";
Microbiology 143:3309-3312(1997).
                                                                                                                                                           11;
                                                                                                                                  Length 211;
                                                                                                                                                              Indels
                                       !ransferase; Kinase; Cysteine biosynthesis; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus.
                                                                                                        7DDC4BDA867FE7C2 CRC64;
                                                                                                                       16.0%; Score 522.5; DB 1; 50.0%; Pred: No. 9.5e-31; Mismatches 59;
                                                                                                                                                                                                                                                                                                                                                                199 AA
                                                                                                                                                                                                                                                                                                                                                 PERVLKTNLSTVSDCVHQVVELLQEQNIVP 217
                                                                                             SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-98044033; PubMed-9384377;
Pfam; PF01583; APS_kinase; 1.
ProDom; PD002350; APS_kinase; 1.
TIGRFAMS; TIGR00455; apsK; 1.
                                                                                                         23770 MW;
                          apsK;
                                                                                                                                               Local Similarity 50.09
nes 105; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                  39
                                                                                                         211 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               phosphotransferase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacillus subtilis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=1423;
                                                                              107
                                                     Phosphorylation
                                                                                                                                                                                                                                                                                                                                                                                                                                    CYC2_BACSU
006735:
                                                                   NP_BIND
ACT_SITE
                                                                                                                                                                                     15
                                                                                                                                                                                                                                         74
                                                                                                                                                                                                                                                                                            134
                                                                                                         SEQUENCE
                                                                                                                                  Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DCDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRENARKIH 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETPERVLKTNL 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   17 NVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSHAIPCYSL 76
Parro V., Pohl T.M., Portetelle D., Porwollik S., Prescott A.M., Presecan E., Pujic P., Purnelle B., Rapoport G., Rey M., Reynolds S., Stieger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie T., Sandian E., Schleich S., Schroeter R., Scoffone F., Sekiguchi J., Sekowska A., Seror S.J., Serror P., Shin B.S., Soldo B., Sorokin A., Tacconi E., Takagia T., Takahashi H., Takemaru K., Takeuchi M., Tamakoshi A., Tanaka T., Terpstra P., Tognoni A., Tosato V., Uchiyama S., Vandenbol M., Vannier P., Vassarotti A., Viari A., Wambutt R., Wedler E., Wedler H., Weitzenegger T., Winters P., Wipat A., Zumakoto H., Yamane K., Yashikawa H.F., Zumsteln E., Yoshikawa H.P., Zumsteln E., Yoshikawa H.P., Zumsteln E., Yoshikawa H.P., Zumsteln E., Yoshikawa H.P., Zumsteln Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATP (BY SIMILARITY).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Adenylyisulfate kinase 2, chloroplast precursor (EC 2.7.1.25) (APS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -!- PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 199;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -!- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15.3%; Score 500; DB 1; Length 19
47.0%; Pred. No. 3.7e-29;
Live 43; Mismatches 57; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ProDom; PD002350; APS_Kinase; 1.
TIGREAMS; TIGRO0455; apsK; 1.
Transferase; Kinase; Cysteine biosynthesis; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      90EC37FE4B02A123 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BIOSYNTHETIC PATHWAY. SIMILARITY: BELONGS TO THE APS KINASE FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           293 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; Y09476; CAA70655.1; ALT_INIT.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Phosphorylation; Complete proteome.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Subtilist; BG13105; yisz.
InterPro; IPR002891; APS_kinase.
Pfam; PF01583; APS_kinase; 1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 phosphoadenylylsulfate.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nature 390:249-256(1997)
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REATING COLUMBIA:

RATE STATIST COLUMBIA:

RA MEDINE FROM N. A.

RA MEDINE COLUMBIA:

RA MEDINE COLUMBIA:

RA POHIT TO DUSSTENDER A., SICHKEMB W., DRILAN R. D., TERTYN N.,

RA HARTIS B., ANSORGE W., Brandt P., Grivell L.A., Rieger M.,

RAILIS B., ANSORGE W., Brandt P., Grivell L.A., Rieger M.,

RAILIS B., ANSORGE W., Brandt P., Watcon M., Schmidtheini T.,

RA CALLEL S. PORTECTELE D., PETER-ALONSO M., BOULTY M., BANCTOK I.

RA CALLE S., MCCULIAGN B., ENDIGOMENCED P., Watcon M., Schmidtheini T.,

RA LORGE SCHWERE T., SIMMERMANN W., Medler H., Ridley P.,.

RA CALLE E., Brandt A., Peters S., Van Staveren M., Dirkse W.,

RADICAR E., Brandt A., Peters S., Van Staveren M., Dirkse W.,

RA MOLIGAR P., Kital Lankborst R., Ross M., Hauf J., Koetter P.,

RA MOLIGAR P., Kital Lankborst R., Ross M., Hauf J., Koetter P.,

RA MONIGAR W., Peters S., Van Staveren M., Dirkse W.,

RA DE KESPER A., Buyssheart C., Gielen J., Villarroel R., De Clercq R.,

RA MONIGAN W. REGERS J., CIANTEN M., Lennard N., Mellar M., Herzl R.,

RA DOSS S., AG HAAN M., MARTS A., Schaffer M., Mellar T.-Auer S.,

RA Gabel C., Found M., Marzse A.C., Schaffer M., Mellar T.-Auer S.,

RA Gabel C., Found M., Marzse A.C., Schaffer M., Aubuur S.,

RA Gabel C., Found M., Marzse A.C., Schaffer M., Mellar S.,

RA Gabel C., Found M., Marzse D., Landerth R., Schaffer M., Mellar R.,

RA Gabel D., Schwarz S., Scholler P., Heber S., Francs P., Bielke C.,

RA Gabel C., Found S., Scholler P., Heber S., Francs P., Bielke C.,

RA Gabel C., Found S., Scholler P., Heber S., Francs P., Bielke C.,

RA Gabel C., Found S., Scholler P., Heber S., Francs P., Bielke C.,

RA Schnabl S., Hiller R., Schaffe W., Melland S., Flank R.,

RA PATINILL L., Dedhild W., Globe S., Francs P., Bielke C.,

RA ALCONIU B., Schwarz S., Scholler P., Heber S., Francs P., Scholler P.,

RA PATINILL L., Dedhild N., Ghoft S., Scholler P., Heber S., Francs P., Scholler P., Rober S., Francs P., Scholler P., Mellar D., Schwarz S., Scholler P., Melar S., Scholler P., Mellar D., Schwarz S., Scholler P., Mellar D.
                                                                                                                                                                                                                       Schiffmann S., Schwenn J.-D.;
"Isolation of cDNA clones encoding adenosine-5'-phosphosulfate-kinase (EC2.7.1.25) from Catharanthus roseus and an isoform (akn2) from
                                                 AANZ
Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           phosphoadenylylsulfate.
PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE
kinase) (Adenosine-5'phosphosulfate kinase) (ATP adenosine-5'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -!- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
                   phosphosulfate 3'-phosphotransferase).
AKN2 OR AT4G39940 OR T5J17.110.
                                                                                                                                                                                                                                                                                                           In) Plant Gene Register PGR98-116.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BIOSYNTHETIC PATHWAY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nature 402:769-777(1999).
                                                                                                                                                                                  SEQUENCE FROM N.A. STRAIN=cv. Columbia;
                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A
                                                                                                                    eurosids II; Bra
NCBL_TaxID=3702;
                                                                                                                                                                                                                                                                                       Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                thaliana
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SUBCELLULAR LOCATION: Chloroplast (By similarity).

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                                                                                                                                                                                                                                                                                                                                                                                                                                                        4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PFAKDRENARKIHESAGLP---FFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDS 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFIS 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            16-0CT-2001 (Rel. 40, Last Sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Probable adenylylsulfate kinase (EC 2.7.1.25) (APS kinase) (Adenosine-
5'phosphosulfate kinase) (ATP adenosine-5'-phosphosulfate 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4 IKKQKTENQQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALE
                                                                                                                                                                                                                                                                                                                                       ATP (POTENTIAL).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Complete grome sequence of the alkaliphilic bacterium Bacillus halodurans and genomic sequence comparison with Bacillus subtilis."; Nucleic Acids Res. 28:4317-431(2000).

-: FUNCTION: CATALYZES THE SYMTHESIS OF ACTIVATED SULFATE.

-: CATALYZIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Masui N.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                     17;
                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1; Length 293;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=C-125 / JCM 9153;
MEDLINE=20512582; PubMed=11058132;
Takami H., Nakasone K., Takaki Y., Maeno G., Sasaki R., Me
Fuji F., Hirama C., Nakamura Y., Ogasawara N., Kuhara S.,
                                                                                                                                                               EMBL, AL035708; CAB38907.1; -
EMBL, AL161596; CAB80657.1; -
EMBL, AL161596; CAB80657.1; -
InterPro; IPR002891; APS kinase.
Promom; PP01583; APS_kinase; 1.
Promom; PP0158350; APS_kinase; 1.
TIGRFAMS; TIGR00455; apsK; 1.
TIGRFAMS; TIGR00455; apsK; 1.
TRANSTASSON TRANSIT PROMOMING; PhosphoryLation; Transit peptide; Chloroplast.
TRANSIT 1 293 ADENIXIZELERATE KINASE 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus
                                                                                                                                                                                                                                                                                                                                                                                        71F1AD6E9B026886 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPY 218
SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                        63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  252 PYEAPVNCEVVLKHTGDDESCSPRQMAE----NIISY
                                                                                                                                                                                                                                                                                                                                                                                                                       Score 497.5; DB 1
Pred. No. 9.5e-29;
3; Mismatches 63
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  202
                                                                                                                                                                                                                                                                                                                                                                         SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                     33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16-OCT-2001 (Rel. 40, Created)
                                                                                                                                                             EMBL; AF043351; AAC39520.1; -.
                                                                                                                                                                                                                                                                                                                                                                                        293 AA; 31977 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                        15.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                      48.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       105; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 phosphotransferase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacillus halodurans.
                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCB1_TaxID=86665;
                                                                                                                                                                                                                                                                                                                                                        196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CYC1_BACHD
                                                                                                                                                                                                                                                                                                                                         NP_BIND
ACT_SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     124
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                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local
Matches 10
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MEDLINE-93075778; PubMed-1332767;
                                                                                                                                                                                         SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                   HAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKD 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                  RENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETP 188
                                                                                                                                                                                                                                                                                                                                                       68
                                                                                                                                                                                                                                                                                                                                                                              22
                                                                                                                                                                                                                                                                                                                                                      9 TENQOKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVS
                                                                                                                                                                                                                                                                                                                                                                           TSNO---PHIVWHEASVSKEERQK----RNRLKSCVVWFTGLSGSGKSTLANALDRKLFE
                                                                                                                                                                                                                                                                                                                                                                                                                 EGIHSYVLDGDNIRHGLNAGLGFSEEDRKENIRRIGEVAKLFVDAGVYTSTAFISPFRED
                                                                                                                                                                                                                                                                                                                                                                                                                                                              FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                                                                                                                                                                                                                                                                                                                 Gaps
           PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                9:
                                                                                                                                                                                                                                                                                                          Length 202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        p23846; Q59389; Q59376; P78105; 01-NOV-1991 (Rel. 20, Created) Clonvov-1991 (Rel. 20, Last sequence update) 15-JUN-2002 (Rel. 41, Last annotation update) Adenyly1sulfate kinase (EC 2.7.1.25) (APS kinase) (Adenosine-5'phosphosulfate kinase) (ATP adenosine-5'phosphotransferase)
                                                                                                                                                                                                   ProDom; PD002350; APS_kinase; 1.
TIGRFAMs; TIGR00455; apsK; 1.
Transferase; Kinase; Cysteine biosynthesis; ATP-binding;
                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Leyh T.S., Vogt T.F., Suo Y.; "The DNA sequence of the sulfate activation locus from
                                                                                                                                                                                                                                                                         SIMILARITY).
6BB294F924F1FCD CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       [2]
SEQUENCE FROM N.A., CHARACTERIZATION, AND ACTIVE SITE
                                              SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                         Score 487.5; DB 1;
Pred. No. 3e-28;
; Mismatches 65;
                                                                                                                                                                                                                                                 ATP (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               200. AA
                                                                                                                                                                                                                                                                                                                                31; Mismatches
                                                                                                                                                                                                                                                                                                         14.9%; Score 487.5; 48.8%; Pred. No. 3e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A., AND SEQUENCE OF 1-8.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ERVLKTNLSTVSDCVHQVVELLQEQ 213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ELIIDTDQLAVEEAVEKIYAYLHAQ 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Biol. Chem. 267:10405-10410(1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                     Phosphorylation; Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CYSC OR B2750 OR Z4058 OR ECS3604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-K12;
MEDLINE-92268080; Pubmed-1316900;
                                                                                                                                                               EMBL; AP001512; BAB05208.1; -.
InterPro; IPR002891; APS_kinase.
Pfam; PF01583; APS_kinase; 1.
                                                                                                                                                                                                                                                                                 202 AA; 22658 MW;
 phosphoadenylylsulfate.
                                                                                                                                                                                                                                                                                                                     Best Local Similarity 48.89
Matches 100; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Escherichia coli, and Escherichia coli 0157:H7
                                   BIOSYNTHETIC PATHWAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                            110
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                                                                                                                                                                                                                                                                                  SEQUENCE
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Satishchandran C., Hickman Y.N., Markham G.D.; "Characterization of the phosphorylated enzyme intermediate formed in the adenosine 5'-phosphosulfate kinase reaction."; Biochemistry 31:11684-11688(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hayashi T., Makino K., Ohnishi M., Kurokawa K., Ishii K., Yokoyama K., Han C.-G., Ohtsubo E., Nakayama K., Murata T., Tanaka M., Tobe T., Iida T., Takami H., Honda T., Sasakawa C., Ogasawara N., Yasunaga T., Kuhara S., Shiba T., Hattori M., Shinagawa H., Complete genome sequence of enterohemorrhagic Escherichia-coli ol57:H7 and genomic comparison with a laboratory strain K-12.":
                                                                                                                                                                              SEQUENCE FROM N.A.
STRAIN=K12 / MG1655;
MEDLINE-97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V., Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Genome sequence of enterohaemorrhagic Escherichia coli O157:H7.";
Nature 409:529-533(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                phosphoadenylylsulfate.
-!- PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-015:H7 / EDL933 / ATCC 700927;

STRAIN-015:H7 / EDL933 / ATCC 700927;

MEDLINE-21074935; PubMed=11206551;

Perna N.T., Plunkett G. III, Burland V., Mau B., Glasner J.D.,

Rose D.J., Mayhew G.F., Evans P.S., Gregor J., Kirkpatrick H.A.,

Posfai G., Hackett J., Klink S., Boutin A., Shao Y., Miller L.,

Apodaca J., Anantharaman T.S., Lin J., Yen G., Schwartz D.C.,

Welch R.A., Blattner F.R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-0157:H7 / RIMD 0509952;
MEDLINE-21156231; PubMed-11258796;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-88115389; PubMed-2828368;
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InterPro; IPR002891; APS_kinase.
Pfam; PF01583; APS_kinase; I.
ProDom; PD002350; APS_kinase; I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; M74586; AAA23647.1; -.
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EMBL; U29579; AAA69260.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; AE000358; AAC75792.1;
EMBL; AE005502; AAG57857.1;
EMBL; AP002562; BAB37027.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BIOSYNTHETIC PATHWAY
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DNA Res. 8:11-22(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PIR; JN0328; JN0328.
PIR; A44200; A44200.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FROM N.A.
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                                                                                                                                                                                                 77 DGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRENAR-KI 135
                                                                                                                                                                                                                                                             136 HESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETPERVLKTN 195
                                                                                                                                                                 6 NVVWHSHPVTVQQR----ELHHGHRGVVLWFTGLSGSGKSTVAGALEEALHKLGVSTYLL 61
                                                                                                                                                    17 NVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSHAIPCYSL 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Arabidopsis thaliana (Mouse-ear cress).
Eukaryota, Viridiplantae, Streptophyta, Embryophyta, Tracheophyta,
Spermatophyta, Magnoliophyta, eudicotyledons, core eudicots, Rosidae,
eurosids II; Brassloales, Brassloaceae, Arabidopsis.
                                                                                                                                                                                                               62 DGDNVRHGLCSDLGFSDADRKENIRRVGEVANLMVEAGLVVLTAFISPHRAERQMVRERV
                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A. MEDIATE-9434502; PubMed-8066145; Jain A., Leustek T.; adenylylphosphosulfate kinase from Arabidopsis "A CDNA clone for 5'-adenylylphosphosulfate kinase from Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
STRAIN=cv. Columbia;
MEDLINE=20083487; PubMed=10617197;
Lin X., Kaul S., Rounsley S.D., Shea T.P., Benito M.-I., Town C.D.,
                                                                                                                                                                                                                                                                                                                                                                                                              30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Adenylylsulfate kinase 1, chloroplast precursor (EC 2.7.1.25) (APS
kinase) (Adenosine-5 phosphosulfate kinase) (ATP adenosine-5'-
                                            41 ATP (BY SIMILARITY).

108 FORMS THE PHOSPHOSERINE INTERMEDIATE.

2190 MW, 1106734E5935F414 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Leustek T.; "Analysis of ATP-sulfurylase and APS-kinase genomic DNA sequences
                                                                                                                             6
                                                                                                     DB 1; Length 200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE-94325358; PubMed-8049272;
Arz H.E., Gisselmann G., Schiffmann S., Schwenn J.-D.;
"A CDNA for adenylyl sulphate (APS)-kinase from Arabidopsis
                                                                                                                             Indels
TIGRFAMS; TIGR00455; apsK; 1.
Transferase; Kinase; Cysteine biosynthesis; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (JUN-1996) to the EMBL/GenBank/DDBJ databases
                                                                                                                             26;
                                                                                                    14.6%; Score 476.5; DB 1 50.2%; Pred. No. 1.8e-27;
                                                                                                                                                                                                                                                                                                                                                                              276 AA.
                                                                                                                            35; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                             phosphosulfate 3'-phosphotransferase).
AKN1 OR AT2G14750 OR F26C24.11 OR T6B13.1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Biochim. Biophys. Acta 1218:447-452(1994).
                                                                                                                                                                                                                                                                                                                                                                               PRT;
                    Phosphorylation; Complete proteome
                                                                                                                                                                                                                                                                                              196 LSTVSDCVHQVVELLQEQNIV 216
                                                                                                                                                                                                                                                                                                             179 -QLVTNLVQQLLDLLRQNDII 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Plant Physiol. 105:771-772(1994).
                                                                                                                                                                                                                                                                                                                                                                                                    30-MAY-2000 (Rel. 39, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=cv. Landsberg erecta;
                                                                                                                            Matches 101; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       in Arabidopsis thaliana.
                                   0
41
108
133
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200 AA;
                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
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                                                        108
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                                                                                                                                                                                                                                                                                                                                                                             KAP1_ARATH
Q43295;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       thaliana."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    thaliana."
                                                       ACT_SITE
CONFLICT
SEQUENCE
                                 INIT_MET
NP_BIND
                                                                                                      Query Match
                                                                                                                  Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  235
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
             Barnstead M.E., Feldblyum T.V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATP (POTENTIAL). FORMS THE PHOSPHOSERINE INTERMEDIATE
Fujii C.Y., Mason T.M., Bowman C.L., Barnstead M.E., Feldblyum T.V Buell C.R., Ketchum K.A., Lee J.J., Ronning C.M., Koo H.L., Moffat K.S., Cronin L.A., Shen M., Pai G., Van Aken S., Umayam L., Tallon L.J., Gill J.E., Adams M.D., Carrera A.J., Creasy T.H., Goodman H.M., Somerville C.R., Copenhaver G.P., Preuss D., Venter J.C.,
                                                                                                                                                                                                                                                                                                                          phosphoadenylylsulfate.
-!- PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Adenylylsulfate kinase, chloroplast precursor (EC 2.7.1.25) (APS
                                                                                                                                                                                 "sequence and analysis of chromosome 2 of the plant Arabidopsis haliana ".
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12;
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                                                                                                                                                                                                                                                                        -1- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        51; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; X75782; CAA53426.1; -.
EMBL; U05238; AAC50035.1; -.
EMBL; U059759; AAC50034.1; -.
EMBL; U59759; AAC24182.1; -.
Interpro; IPR002891; APS_Kinase.
Prodom; PF01583; APS_Kinase; 1.
TIGROWAS; TIGR00455; apsK; 1.
TIGROWAS; TIGR00455; apsK; 1.
TIGRPAMS; TIGR00455; apsK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Phosphorylation; Transit peptide; Chloroplast.
TRANSIT 1 37 CHLOROPLAST (POTENTIAL).
CHAIN 38 276 ADENYLYLSULFATE KINASE 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CB698643AA09D811 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                     BIOSYNTHETIC PATHWAY.
-!- SUBCELLULAR LOCATION: Chloroplast.
-!- SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14.6%; Score 476; DB 1; 50.8%; Pred. No. 3.1e-27; iive 29; Mismatches 51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ą.
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                                                                                                                                                                                                                                               Nature 402:761-768(1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
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108
182
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049204;
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                                                                                                                                                                                                                      thaliana.
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Best Local 3
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62
                                                                                                               SEQUENCE FROM N.A.
Schlffmann S., Schwenn J.-D.;
"Isolation of cDNA clones encoding adenosine-5' phosphosulfate-kinase (EC2.7.1.25) from Catharanthus roseus and an isoform (akn2) from Arabidopsis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GIKKOKTENQOKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SRGLHAKGKLTYILDGDNVRHGLNSDLSFKAEDRAENIRRIGEVAKLFADAGVICIASLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPFAKDRENARKIHESAGLP - - - FFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATP (POTENTIAL).
FORMS THE PHOSPHOSERINE INTERMEDIATE (BY
                                Catharanthus roseus (Rosy periwinkle) (Madagascar periwinkle). Usukaryota: Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; eudicotyledons; core eudicots; Asteridae; euasterids I; Gentianales; Apocynaceae; Rauvolítoideae;
                                                                                                                                                                                                                                 CYSTEINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15;
 (Adenosine-5'phosphosulfate kinase) (ATP adenosine-5'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               14.4%; Score 469.5; DB 1; Length 312; 47.7%; Pred. No. 1.1e-26;
                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                     Probons, rucesos, ...

IIGREAMS; TIGRO0455; apsK; 1.

Transferase, Kinase, Cysteine biosynthesis; ATP-binding;

Transferase, Kinase, Cysteine biosynthesis, ATP-binding;

Phosphorylation; Transit peptide; Chloroplast

CHLOROPLAST (POTENTIAL).
                                                                                                                                                                                                                                         BIOSYNTHETIC PATHWAY.
SUBCELLULAR LOCATION: Chloroplast (By similarity).
SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16BBD11FB4B1FE27 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     68;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DPYEPPLKSEIVLHOKLGMCDSPCDLADIVISYLEE 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SIMILARITY)
          phosphosulfate 3'-phosphotransferase).
                                                                                                                                                                                                                                                                                                                                                                                        Interpro: IPR002891; APS_kinase.
Pfam: PF01583; APS_kinase; 1.
ProDom; PD002350; APS_kinase; 1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        312 AA; 33656 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                Catharanthus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 103; Conserv
                                                                                           NCBI_TaxID=4058;
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                                                                                Vinceae;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              70 AIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDR 129
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                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.

STRAINEL TOR NIG961 / Serotype 01;

MEDLINE-2040683; PubMed-10952301;

Heidelberg J.F., Elsen J.A., Nelson W.C., Clayton R.A., Gwinn M.L.,

Dodson R.J., Haft D.H., Hickey E.K., Peterson J.D., Umayam L.A.,

Gill S.R., Nelson K.E., Read T.D., Tettelin H., Richardson D.,

Ermolaeva M.D., Vamathevan J., Bass S., Qin H., Dragoi I., Sellers P.,

McDonald L., Utterback T., Fleischmann R.D., Nierman W.C., White O.,

Salzberg S.L., Smith H.O., Colwell R.R., Mekalanos J.J., Venter J.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ENQOKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PHOSPHOSERINE INTERMEDIATE (BY
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                                                                                                                                                                                                                     Bacteria; Proteobacteria; gamma subdivision; Vibrionaceae; Vibrio.
NCBL_TaxID=666;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           phosphoadenylylsulfate.
--- PATHWAY: SECOND STEP IN THE SULFATE ACTIVATION PATHWAY. THIS REACTION OCCURS EARLY IN THE REDUCTIVE BRANCH OF THE CYSTEINE BIOSYNTHETIC PATHWAY.
--- SIMILARITY: BELONGS TO THE APS KINASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "DNA sequence of both chromosomes of the cholera pathogen Vibrio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nature 406:477-483(2000).
-!- FUNCTION: CATALYZES THE SYNTHESIS OF ACTIVATED SULFATE.
-!- CATALYTIC ACTIVITY: ATP + adenylylsulfate = ADP + 3'-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 215;
65; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Interpro; IPR002891; APS_kinase.
Pfam; PF01583; APS_kinase; 1.
Prodom: PD002350; APS_kinase; 1.
TIGRPAMs; TIGR00455; apsk; 1.
Transferase; Kinase; Cysteine biosynthesis; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        83B9EE2F295CDDF6 CRC64;
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                                                                                                                              phosphotransferase).
CYSC OR VC2558.
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                                                                                                                                                                                              Vibrio cholerae
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CYSC\_VIBCH STANDARD; 09KP21; 16-OCT-2001 (Rel. 40, Created)

AC I

CYSC\_VIBCH RESULT 15

Search completed: May 30, 2003, 12:18:02 Job time : 25 secs

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COTESSUI MARLE HELANA (USETO)

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(without alignments)
1439.988 Million cell updates/sec
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3271
1 MSGIKKQKTENQQKSTNVVY......MAPKAWKVLTDYYRSEMDKN 615
                                                                                                                           May 30, 2003, 12:14:14 ; Search time 88 Seconds
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GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
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                                                                                                                                                                                                                                                                                                                                                               671580 segs, 206047115 residues
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Maximum Match 100%
Listing first 45 summaries
                                                                                    OM protein - protein search, using sw model
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Gapop 10.0 , Gapext 0.5
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Maximum DB seq length: 2000000000
                                                                                                                                                                                                             Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                    Scoring table:
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sp\_unclassified:\* sp\_fungi:\*
sp\_human:\*
sp\_invertebrate:\* sp\_vertebrate:\* sp\_rvirus:\*
sp\_bacteriap:\* sp\_organelle:\* SPTREMBL\_21:\*
: sp\_archea:\*
: sp\_bacteria:\* sp\_archeap:\* sp\_plant:\* sp\_rodent:\* sp\_mammal:\* sp\_virus:\* sp\_phage: \*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

		æ	ŧ,			
Result No.	Score	Query Match	Query Match Length DB	DB	ID	Description
П	3020.5	92.3	620	11	Q9JK86	Q9jk86 cavia porce
7	2965.5	90.7	621	11	Q9QYS0	Ogdys0 mus musculu
٣	2638.5	80.7		13	Q90XY2	090xy2 fugu rubrip
4	2602	79.5		4	096TF4	096tf4 homo sapien
S	2596	79.4		4	Q9P1P9	09plp9 homo sapien
9	2588	79.1		4	Q9UE98	Q9ue98 homo sapien
7	2367	72.4		S	027128	Q27128 urechis cau
8	2233.5	68.3		Ŋ	09NDP8	Q9ndp8 ciona intes
6	2039	62.3		S	Q961A8	Q961a8 drosophila
10	2031.5	. 62.1		S	Q9VW48	Q9vw48 drosophila
11	1887	57.7		S	022501	Q22501 caenorhabdi
12	1351.5	41.3	265	4	Q9UIR2	Q9uir2.homo sapien
13	1301	39.8		10	Q9LIK9	Q9lik9 arabidopsis
14	1299	39.7		10	Q43170	Q43170 solanum tub
15	1282	39.2		10	042520	Q42520 arabidopsis
16	1282	39.5		10	096530	Q96530 arabidopsis

1;

Gaps

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DB 11; Length 620;

Query Match 92.3%; Score 3020.5; DB 11; Lengt Best Local Similarity 91.5%; Pred. No. 9.2e-235; Matches 563; Conservative 26; Mismatches 21; Indels

61 ALESYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITS 120

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17 1282 39.2 465 10 023324 18 1274 38.9 463 10 043183 19 1268.5 38.8 476 10 043183 20 1265 38.8 476 10 0958L0 21 1260 38.5 483 10 0958L0 22 1265 38.4 470 10 0958L0 23 1259.5 38.4 470 10 0958L0 24 1257.5 38.4 470 10 0958L0 25 1254.5 38.4 470 10 0958L0 25 1254.5 38.4 470 10 0958L0 26 1255.5 38.4 470 10 0958L0 27 1250 38.2 463 10 0958L2 28 1244.5 38.0 461 10 0958L2 29 1244.5 38.0 461 10 0958L2 29 1244.5 38.0 461 10 0958L2 29 1245 38.1 476 10 0958L2 29 1246.5 38.0 461 10 0958L2 29 1247.5 37.6 489 10 0958L2 29 1248.5 37.6 489 10 0958L2 29 1248.5 37.6 489 10 0958L2 20 1225 37.1 475 10 0958L2 20 1225 37.1 475 10 0958L2 21 125 37.1 475 10 0958L2 21 125 37.1 475 10 0958L2 21 128.5 35.9 461 10 0958L2 22 128.5 37.1 475 10 0958L2 23 095R6 24 10.0 095R7 24 10.0 095R7 25 12.1 14.1 200 10 095R7 24 10.0 095R7 25 12.1 14.1 200 10 095R7 26 10.0 095R8 27 10.0 095R8 28 10.0 057R8 28 10.0 057R8 29 10.0 057R8 20 10.0 057	023324 arabidopsis 04387 octanum tub 044387 arabidopsis 096541 brassica ol 095b10 brassica ol 095b10 brassica ol 095n2 arabidopsis 095n2 arabidopsis 095n2 arabidopsis 095n4 allum cepa 095p4 accom 09639 can old 095p4 according 095p4 according 095p7g saccharomyc 090pf8 saccharomyc 090pf8 saccharomyc 090pf8 saccharomyc 095p7y klebsiella 098py arabidopsis 096f1x1 arabidopsis	ALIGNMENTS  PRT; 620 AA.  eated) st sequence update) st annotation update) anse/ATP sulfurylase 2.  Craniata; Vertebrata; Euteleostomi; Hystricognathi; Caviidae; Cavia.  sine 5'-phosphosulfate kinase/ATP 2': BL/GenBank/DDBJ databases. e. rylase. ; 1. i.
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Kurima K., Singh B., Schwartz N.B.;
Kurima K., Singh B., Schwartz N.B.;
"Genomic organization of the mouse and human genes encoding the ATP Sulfurylase/Adenosing 5'-phosphosulfate kinase isoform SK2.";
J. Biol. Chem. 274:33306-3312(1999).
EMBL; AF172866; AAF12760.1;
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Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Mus.
NCBI_TaxID=10090;
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Deyrup A., Schwartz N.B.;
"A member of a family of sulfate-activating enzymes causes murine
brachymorphism.";
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90.7%; Pred. No. 2.5e-230;
ive 21; Mismatchès 31;
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EMBL, AF172861; AAF17760.1; JOINED. EMBL, AF172862; AAF12760.1; JOINED. EMBL, AF172862; AAF12760.1; JOINED. EMBL, AF172864; AAF12760.1; JOINED. EMBL, AF172864; AAF12760.1; JOINED. EMBL, AF172865; AAF12760.1; JOINED. MGD; MGT:1330223; PAPSS2.
INTEAFPO; IPR002891; APS_kinase.
INTEAFPO; IPR002891; APS_kinase.
INTEAFPO; IPR002650; ATP-Sulfurylase.
Pfam; PF01583; APS_kinase; 1.
ProDom; PD003350; ATP-Sulfurylase; 1.
ProDom; PD003350; APS_kinase; 1.
ProDom; PD003350; APS_kinase; 1.
FIGRFAMS; TIGR04655; APS_Kinase; 1.
Kinase: Minimal APS_MINIMAL AND APS_MINIMAL APS_MINIMAL APS_MINIMAL APS_MINIMAL AND APS_MINIMA
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                                                                                                                                                                                                                                                        Gaps
       Fugu rubripes (Japanese puferfish) (Takifugu rubripes).
Eukaryota: Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Actinopterygii; Neopterygii; Teleostei; Euteleostei; Neoteleostei;
Acanthomorpha; Acanthopterygii; Percomorpha; Tetraodontiformes;
Tetraodontidae; Takifugu.
NCBI_TaxID=31033;
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                                                                                            S., Tan Y.H.,
                                                                                                                                                                                                                                     DB 13; Length 613;
                                                                                                                                                                                                                                    80.7%; Score 2638.5; DB 13; Lengt
79.3%; Pred. No. 5.6e-204;
.ive 60; Mismatches 66; Indels
                                                                                                            human PTEN locus PTEN function.";
                                                                                                                                                                                                        TIGREAMS; TICR00455; apsK; 1. SEQUENCE 613 AA; 68948 MW; 28E50148377C4169 CRC64;
                                                                       SEQUENCE FROM N.A.
MEDLINE=21455682; PubMed=11571655;
Yu W.P., Pallen C.J., Tay A., Jirik F.R., Brenner
3'-phosphoadenosine 5'-phosphosulfate synthase 2
                                                                                                           "Conserved synteny between the Fugu and hun
evolutionary conservation of vertebrate PTI
oncogene 20:554-5561(2001).
EMBL, AF325922; AAL08416.1; -
InterPro; IPR002650; AFP-sulfurylase.
InterPro; IPR002650; AFP-sulfurylase.
PFfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                      ProDom; PD002350; APS_kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
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                                                                                                    Venkatesh B.;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Human 3'-phosphoadenosine 5'-phosphosulfate synthetase 1 (PAPSS1) and PAPSS2: gene cloning, characterization and chromosomal localization."; Biochem. Biophys. Res. Commun. 268:437-444(2000).
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Mammalia; Butheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Wood T.C.,
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Prodom; PD002381; ATP-sulfurylase: 1.
TIGRFAMS; TIGR00455; apsK; 1.
SEGHENCE 624 AA; 70833 MW; A3DC9B943E68CDD6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
MEDLINE=20145452; PubMed=10679223;
MEDLINE=20145452; PubMed=10679223;
Mitchell S., Moon E., Kim U.-J., Xu J.-P., Siciliano Weinshilboum R.M.;
                                                                      01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-UN-2002 (TrEMBLrel. 21, Last annotation update)
3'-phosphoadenosine 5'-phosphosulfate synthetase.
PAPSS.
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Pred. No. 5.1e-201;
    A.
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624
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    PRT;
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77.18;
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Strausberg R.;
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129 TSFISPYTQDRNNARQIHEGASLPFFEVFVDAPLHVCEQRDVKGLYKKARAGEIKGFTGI 188
                                     DSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVR 238
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01-MAY-2000 (TrEMBLrel. 13, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
ATP sulfurylase/APS Kinase.
ATP sulfurylase/APS Kinase.
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
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EMBL; AF016496; AAD03325.1; -.
InterPro; IPR002891; APS-Kinase.
InterPro; IPR002650; ATP-sulfurylase.
Pfam; PF01583; APS-kinase; 1.
ProDom; PF002350; APS-kinase; 1.
ProDom; PD002350; APS-kinase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Deyrup A.T.;
"Human ATP sulfurylase/APS kinase.
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KAWTVLTEYYKS 620
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SEQUENCE
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                              VLPVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKM
                                                                                 VMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGH
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
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Prodom; PD002381; ATP-sulfurylase; 1.
TIGRRAMs; TIGR00455; apsk; 1.
SEOUENCE 624 AA; 70859 MW; 60DC9B943E7B75ED CRC64;
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InterPro: IPR002650; ATP_sulfurylase.
Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
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01-OCT-2000 (TrEMBLrel. 15, Last seq
01-JUN-2002 (TrEMBLrel. 21, Last ann
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KAWTVLTEYYKS 620
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Hotta K., Takahashi H., Asakura T., Saitoh B., Takatori N., Satou Y.,
Satoh N.;
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Phlebobranchia; Cionidae; Ciona.
NCBI_TaxID=7719;
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EMBL; AB036852; BAB00629.1; "InterPro; IPR002891; APS. Kinase.
InterPro; IPR002650; ATP-sulfurylase.
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ProDom; PD002381; ATP-sulfurylase;
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SMALEEYLVCHGIPCYTLDGDNIRQGLNKNLGFSPEDREENVRIAEVAKLFADAGLVCI 128
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                                                                                                                                                                           DSDYEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIHELFVPENKLDHVR
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                                                 TSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGI
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Urechis caupo (Innkeeper worm) (Spoonworm).
Eukaryota: Metazoa; Echiura; Xenopneusta; Urechidae; Urechis.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ol-NOV-1996 (TrEMBLrel. 01, Created) 01-NOV-1996 (TrEMBLrel. 01, Last sequence update) 01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
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Pred. No. 4.3e-182;
69; Mismatches 104;
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"A multifunctional Urechis caupo protein, PAPS
Pre sulfurylase and APS kinase activities.";
Gene 165:243-248(1995)...
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ProDom; PD002381; ATP-sulfurylase; 1.
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Interpro; IPR00260; ATP-sulfurylase.
Pfam; PP01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
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KAWTVLTEYYKS 620
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                                                 ENQOKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLTGLSGAGKTTISFALEEYLVSH
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PAPS OR CG8363.
Drosophila melanogaster (Fruit fly).
Bukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta;
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha;
Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Stapleton M., Brokstein P., Hong L., Agbayani A., Carlson J., Champe M., Chawez C., Dorsett V., Farfan D., Frise E., George R., Gonzalez M., Guarin H., Li P., Liao G., Miranda A., Mungall C.J., Nunoo J., Pacleb J., Paragas V., Park S., Phouanenavong S., Wan K. Yu C., Lewis S.E., Rubin G.M., Celniker S.; Submitted (AUG-2001) to the EMBL/GenBank/DDBJ databases.
                        1;
        Length
                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last sequence update)
Last annotation update)
       5;
      Score 2233.5; DB 5;
Pred. No. 2.5e-171;
; Mismatches 115;
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68.3%; Scc.
68.2%; Pred
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                        Conservative
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               Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            182 YEKPETPERVLKTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIH----ELFVPEN-KLDHV 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RAEAETLPSLSITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLD--DGVI--N 293
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(ATP-sulfurylase)
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01-MAY-2000 (TEMBLrel. 13, Created)
01-OCT-2000 (TEMBLrel. 15, Last sequence update)
01-OCT-2000 (TEMBLrel. 15, Last annotation update)
01-JUN-2002 (TEMBLrel. 21, Last annotation update)
Bifunctional ATP sulfurylase/APS kinase (EC 2.7.7.4) (Sulfate
adenylytransferase) (Sulfate adenylate transferase) (ATP-sulf
(PAPS protein) (CG8363 protein).
PAPS OR CG8363.
Drosophila melanogaster (Fruit fly).
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta;
                                                                                                                                                                                                                                                                                          Length 629;
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                                                                                                                                                                                                                                          6FF3F8797D98CCB3 CRC64;
                                                                                                                                                                                                                                                                                          Query Match 62.3%; Score 2039; DB 5; Best Local Similarity 63.1%; Pred. No. 1.2e-155; Matches 392; Conservative 95; Mismatches 120;
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EMBL; AY051724; AAK93148.1; -
FlyBase; FBgn0020389; Paps.
InterPro; IPR002891; APS_kinase.
InterPro; IPR002650; ATF-sulfurylase.
Pfam; PF01747; ATF-sulfurylase; 1.
ProDom; PD0022350; ARS_kinase; 1.
ProDom; PD002381; ATF-sulfurylase; 1.
TIGRFAMS; TIGR00455; apsK; 1.
SEQUENCE 629 AA; 71146 MW; 6FF3F879;
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QVATNVTEQKHHVTRETRGKNLGLCRGFRGCTVWLTGLSGAGKTSIAFELEAYLVSRGIP 77

73 CYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCITSFISPFAKDRENA

137

us-09-898-165b-7.rspt

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022501
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RA Adams W.D., Celniker S.E., Holt R.A., Evans C.A., Gocayne J.D.,
RA Adams W.D., Celniker S.E., Holt R.A., Evans C.A., Gocayne J.D.,
RA Adams W.D., Celniker S.E., Richards S., Ashburner M., Henderson S.N.,
Sutton G.G., Worthan J.R., Yandell M.D., Zhang Q., Chen L.X.,
RA Adamon R.C., Rogers Y.-H.C., Blazej R.G., Changen M., Refelfer B.D.,
RA Adril J.F., Agbayani A., An H.-J. Andrews Pfannkoch C., Baldwin D.,
RA Ballew R.M., Basu A., Baxendal B.P., Bhandari D., Bolshakov S.,
RA Ballew R.M., Basu A., Baxendal B.P., Bhandari D., Bolshakov S.,
RA Burtis N.C., Busam D.A., Lautler H., Cadieu E., Center A., Chandra I.,
RA Burtis R.C., Busam D.A., Buller H., Cadieu E., Center A., Chandra I.,
RA Burtis N.C., Evangeliste C.C., Ferraz C., Ferriaez S., Dunkov B.C., Dunn P.,
RA Burtis N.L., Evangeliste C.C., Ferraz C., Ferriaez S., Pleits Chunn R.,
RA Bodson K., Doup L.E., Downes M., Dugan-Rocha S., Dunkov B.C., Dunn P.,
RA Burtis N.L., Harvey D., Helman T.J., Hernandez J.R., Harris M.,
RA Harris N.L., Harvey D., Helman T.J., Hernandez J.R., Harris M.,
Alasko P., Lei Y., Levitsky A.A., Li J., Wei M.-H., Ibeeyam C.,
Alasko P., Lei Y., Levitsky A.A., Li J., Li Z., Liang Y., Lin X.,
Lasko P., Lei Y., Levitsky A.A., Li J., Li Z., Liang Y., Lin X.,
Merkulov G., Milshina N.V., Mobarry C., Morins J., Moshrefi A.,
Mount S.M., Moy M., Murphy B., Murphy L., Marshy D.M., Nelson D.L.,
Ralazzollo M., Pittman G.S., Pan S., Pollard J., Puri V., Reese M.G.,
Ralazzollo M., Pittman G.S., Pan S., Pollard J., Puri V., Rang X.,
Randert K., Renington K.A., Nixon K., Nussen D.M., Nelson D.K.,
Reinert K., Renington K.A., Nixon K., Nussen D.M., Nelson D.K.,
Randert K., Wasarman D.A., Nixon K., Wu D., Yang S., Yao Q.A.,
Randiams S.M., Woodage T., Worley K.C., Who D., Yang S., Yao Q.A.,
Randiams S.M., Woodage T., Worley K., Who D., San B.,
Spiere E., Spradling A.C., Siapeleton M., Strong R., San R.,
Spiere E., Spradling A.C., Siapeleton M., Strong R., San K.,
Shone S.M., Woodage T., W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -i - CATALYTIC ACTIVITY: ATP + SULFATE = DIPHOSPHATE + ADENYLYLSULFATE.
EMBL, Y12861; CA773681; -...
FEMBL, AC003515; AFF49102.1; ALT_SEQ.
FLYBASE; FBGN0020389; Faps.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62.1%; Score 2031.5; DB 5; Length 630; 63.4%; Pred. No. 5e-155; ive 94; Mismatches 116; Indels 13; Gaps
Diptera; Brachycera; Muscomorpha;
                                                                      SEQUENCE FROM N.A.
MEDLINE-98092112; PubMed=9431815;
Jullien D., Crozatier M., Kas E.;
"CDNA sequence and expression pattern of the prosophila melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           D688DC79DBBEDC76 CRC64;
                                                                                                                                                    PAPS synthetase gene: a new salivary gland marker. Mech. Dev. 68:179-186(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nucleotidyltransferase; Transferase.
CONFLICT 270 270 MISSING (IN REF. 1).
                Ephydroidea; Drosophilidae; Drosophila.
NCBL_TaxID=7227;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Interpro; IPR002891; APS_kinase.
Interpro; IPR002650; ATP-sulfurylase.
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ProDom; PD002381; ATP-sulfurylase; 1.
  Endopterygota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pfam; PF01583; APS_kinase; 1.
Pfam; PF01747; ATP-sulfurylase; 1.
                                                                                                                                                                                                                                                  MEDLINE=20196006; PubMed=10731132;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
  Pterygota; Neoptera;
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                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                  STRAIN-BERKELEY;
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Best Local
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248
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133 RKIHESAGLPFFEIFVDAPLNICESRDVKGLYKRARAGEIKGFTGIDSDYEKPETPERVL 192
                                                                   197
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                                                                                                                                                                                                                                                                               249 ITKLDLQWVQVLSEGWATPLKGFMREKEYLQVMHFDTLLD--DGVI--NMSIPIVLPVSA
                                                                                                                                                                                                                                                                                                                   485 MLYAGPTEVOWHCRSRMIAGANFYIVGRDPAGMPHP--ETKKD--LYEPTHGGKVLSMAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        193 KTNLSTVSDCVHQVVELLQEQNIVPYTIIKDIH---ELFVPEN-KLDHVRAEAETLPSLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMNADAVFAFQLRNPVHNGHALLMQD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                425 TCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQHAAVLEEGVLDPKSTIVAIFPSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541 GLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTRMRKLAREGENPPDGFMAPKA
                                                                                                                                                                                                                                                                                                                                                                                                                   305 EDKTRLEGCSKFVLAHGGRRVAILRDAEFYEHRKEERCSRVWGTTCTKHPHIKMVMESGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eukaryota; Metazoa; Nematoda; Chromadorea; Rhabditida; Rhabditoldea; Rhabditidae; Peloderinae; Caenorhabditis.
NCBI_TaxID=6239;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Genome sequence of the nematode C.elegans: A platform for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (JAN-1996) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; Z68880; CAA93098.1; -.
InterPro; IPR002891; APS_kinase.
InterPro; IPR00260; ATP-sulfurylase.
Pfam; PF01583; APS_kinase; 1.
ProDom; PD002350; APS_kinase; 1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=99069613; PubMed=9851916;
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Science 282:2012-2018(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-NOV-1996 (TrEMBLrel. 01, 01-NOV-1996 (TrEMBLrel. 01, 01-JUN-2002 (TrEMBLrel. 21,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             617 WRILATYYON 626
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SEQUENCE FROM N.A.
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387; Conservative

Matches

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478
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                                                                                                                                                  SEQUENCE
                                                                                                                                                                   Query Match
                                                                                                                        ProDom;
                                                                                                                                                                                                                                                                                                                                                                                                                     Q9LIK9
                                                                                                                                                                                     Matches
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Q9LIK9
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                                                                                                                                                                                                                                          313
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                                                                                                                                                                                                                                                                                                                                            551
                                                                                                                                                                                                                                                                                                                                                                                                                    395 QKCKEMNADAVFAFQLRNPVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVP 454
                                                                                                                                                                                                                                                                                                                                                                     LDWRMKQHAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDP '514
                                                                                                                                                                                                                                                                                                                                                                                                          AGMPHPETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFD 574
                                                                          59
                                                                                   14 MPMLKKPRYSSLSGQSTNITYQEHTISREERAAAVGRHEGFRGCTIWFTGLSGAGKTTIS 73
                                                                                                                                                                                                                      60 FALEEYLVSHAIPCYSLDGDNVRHGLNRNLGFSPGDREENIRRIAEVAKLFADAGLVCIT
                                                                                                                                                                                               -------DGVINMSIPIVLPVSAEDKTRLEGCSKFVLAHGGRRVAILRDAEFY
                                                                                                                                                                                                                                                                    314 GEKSDDKEDSWPMMDD-INQSIPIVLPISDDVKKGLEGVTRIALKYNGQVYALLSDPEIF
                                                                                                                                                                                                                                                                                              EHRKEERCSRVWGTTCTKHPHIKMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELK
                                                                         1 MSGIKKQKTEN-QQKSTNVVYQAHHVSRNKRGQVVGTRGGFRGCTVWLJGLSGAGKTTIS
                                                                                                                                                                                                                                                                                                                                                                                Gaps
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BEDLINE-208337975; Pubmed-9671738;
Kurima K., Warman M.L. Krishnan S., Domowicz M., Krueger R.C. Jr.
Deyrup A., Schwartz N.B.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "A member of a family of sulfate-activating enzymes causes murine brachymorphism.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Euteleostomi;
                                                       28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (Fragment)
                                     Length 652;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Butele
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                       Indels
                    36148F20C31AD875 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                             575 FISGTRMRKLAREGENPPDGFMAPKAWKVLTDYYRSEMDKN 615
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 57.7%; Score 1887; DB 5; Best Local Similarity 56.5%; Pred. No. 2.3e-143; Matches 362; Conservative 100; Mismatches 151;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Proc. Natl. Acad. Sci. U.S.A. 95:8681-8685(1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               265 AA
ProDom; PD002381; ATP-sulfurylase; 1.
TIGRFAMS; TIGR00455; apsK; 1.
SEQUENCE 652 AA; 72987 MW; 36148F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Homo sapiens (Human).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=9606;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181 MAPGLISVEIIPFRVAAXNKAKKAMDFYDPASSLLPPCNRHNEFDFISGTRWRKLAREGE
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Bukaryota, Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
MEDLINE-20056854; PubMed=10559207;
Kurima K., Singh B., Schwartz N.B.;
Kurima K., Singh B., Schwartz N.B.;
Genomic organization of the mouse and human genes encoding the ATP
Sulfurylase/Adenosine 5'-phosphosulfate kinase isoform SK2.";
J. Biol. Chem. 274:33306-33312(1999).
EMBL; AR173364; AAR12780.1;
EMBL; AR173361; AAR12780.1;
EMBL; AR173362; AAR12780.1;
InterPro; IPR002050; APP-sulfurylase.
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                                                                                                                                                                                                                                                                                                                                                                          Length 265;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
ATP sulfurylase/APS kinase (AT3922890/F5N5_6) (Putative ATP sulfurylase/APS kinase) (Putative ATP sulfurylase).
F5N5.6 OR AT3G22890, F5N5.6 OR AT3G22890.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         covered by
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to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        chromosome
                                                                                                                                                                                                                                                                                                                            D75A2374E40C334F CRC64;
                                                                                                                                                                                                                                                                                                                                                                          DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    thaliana chro
4,251,695 bp
                                                                                                                                                                                                                                                                                                                                                                        Score 1351.5; DB 4
Pred. No. 8.7e-101;
2; Mismatches 1;
                                                                                                                                                                                                                                                                                    Kinase; Nucleotidyltransferase; Transferase.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NPPDGFMAPKAWKVLTDYYRSEMDKN 615
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"Structural analysis of Arabidopsis
Sequence features of the regions of
TAC and BAC clones.";
DNA Res. 7:217-221(2000).
                                                                                                                                                                                                                                                       PD002381; ATP-sulfurylase;
                                                                                                                                                                                                                                    Pfam; PF01747; ATP-sulfurylase; 1.
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MEDLINE=20363099; PubMed=10907853;
                                                                                                                                                                                                                                                                                                                            30142 MW;
                                                                                                                                                                                                                                                                                                                                                                        Match 41.3%;
Local Similarity 95.5%;
es 254; Conservative
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Kaneko T., Kato T., S
Submitted (MAR-2000)
                                                                                                                                                                                                                                                                                                                            265 AA;
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SEQUENCE FROM N.A.
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NCBI_TaxID=3702;
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239 461

401

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L-LDDG-VINMSIPIVLPVSAEDKTRLEGCSKFVLAHG-GRRVAILRDAEFYEHRKEERC-342
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                                                                                                                                                                                           343 SRVWGTTCTKHPHI-KMVMESGDWLVGGDLQVLEKIRWNDGLDQYRLTPLELKQKCKEMN
                                                                                                                                                                        402 ADAVFAFQLRNPVHNGHALLMQDTCRRLLERGYKHPVLLLHPLGGWTKDDDVPLDWRMKQ
                                                                                                                                                                                                                                                    462 HAAVLEEGVLDPKSTIVAIFPSPMLYAGPTEVQWHCRSRMIAGANFYIVGRDPAGMPHPE
                                                                                                                                                                                                                                                                                                                               522 TKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPAÄHNEFDFISGTRM
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Klouus D., Hoefgen K., Willmitzer L., Riesmeier J.W.;
"Isolation and characterization of two cDNAclones encoding ATP-sulfurylase from Potato by complementation of a yeast mutant.";
Plant J. 6:105-112(1994).
EMBL: X75041; CAA52953.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 424;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Trachec
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Asteridae; euasterids I; Solanales; Solanaceae; Solanum.
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SEQUENCE 424 AA; 47519 MW; E02A27DC11350ABC CRC64;
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Last annotation update)
(EC 2.7.7:4).
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3e-96;
ches 81;
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61.7%; Pred. No. 3e-9
ive 64; Mismatches
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Pfam. PF0177; ATP-sulfurylase; 1.
ProDom; PD002381; ATP-sulfurylase; 1.
TIGRPAMS; TIGR00339; SOPT; 1.
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STRAIN-DESIREE; TISSUE=LEAF;
MEDLINE=95004649; PubMed=7920699;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             043170;
01-NOV-1996 (TrEMBLrel. 01, 01-NOV-1996 (TrEMBLrel. 01, 01, 01-JUN-2002 (TrEMBLrel. 21, 1) Sulfate adenylyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Solanum tuberosum (Potato).
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                  286
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Bowser L., Carninci P., Dale J.M., Goldsmith A.D., Hayashizaki Y.,
Ishida J., Jiang P.X., Jones T., Kamiya A., Karlin-Neumann G.,
Kawai J., Lam B., Lee J.M., Lin J., Liu S.X., Miranda M., Narusaka M.,
Nguyen M., Onodera C.S., Palm C.J., Pham P.K., Quach H.L., Sakurai T.,
Satou M., Seki M., Southwick A., Tang C.C., Toriumi M., Yamada K.,
Yamamura Y., Yu G., Yu S., Shinozaki K., Davis R.W., Theologis A.,
                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.

Yamada K., Liu S.X., Pham P.K., Banh J., Dale J.M., Goldsmith A.D.,

Yamada K., Liu S.X., Pham P.K., Banh J., Dale J.M., Goldsmith A.D.,

Jiang P.X., Lee J.M., Onodera C.S., Quach H.L., Tang C., Toriumi M.,

Yamamura Y., Yu G., Yu S., Bowser L., Carninci P., Chen H., Cheuk R.,

Hayashlzaki Y., Yu G., Jones T., Kamiya A., Karlin-Neumann G.,

Kawai J., Kim C., Koesema E., Lan B., Lin J., Meyers M.C., Miranda M.,

Narusaka M., Nguyen M., Palm C.J., Sakurai T., Satou M., Seki M.,

Shinn P., Southwick A., Tracy S.E., Shinozaki K., Davis R.W.,

Ecker J.R., Theologis A.,
                                                                                                                                                                                                                         SOUTENCE FROM N.A.
SOUTENTER A., Karlin-Neumann G.; Nguyen M., Lam B., Miranda M.,
Southwick A., Karlin-Neumann G.; Nguyen M., Lam B., Miranda M.,
Chalm C.J., Bowser L., Jones T., Banh J., Carninci P., Chen H.,
Kim C., Lin J., K., Hasshizaki Y., Ishida J., Kamiya A., Kawai J.,
Kim C., Lin J., Liu S.X., Narusaka M., Pham P.K., Sakano H.,
Sakurai T., Satou M., Seki M., Shinn P., Yamada K., Shinozaki K.,
Submitted (APR-2001) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Yamada K., Banh J., Chan M.M., Chang C.H., Chang E., Dale J.M.,
Deng J.M., Goldsmith A.D., Lee J.M., Onodera C.S., Quach H.L.,
Tang C., Toriuml M., Wu H.C., Yamamura Y., Yu G., Bowser L.,
Carninci P., Chen H., Cheuk R., Hayashizaki Y., Ishida J., Jones T.,
Kamiya A., Karlin-Neumann G., Kawai J., Kim C., Lam B., Lin J.,
Meyers M.C., Miranda M., Narusaka M., Nguyen M., Palm C.J.,
Sakurai T., Satou M., Seki M., Shinn P., Southwick A., Shinozaki K.,
"Arabidopsis Open Reading Frame (ORF) Clones.";
Submitted (MAR-2002) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Lam B., Southwick A., Karlin-Neumann G., Nguyen M., Miranda M., Balm C.J., Bowser L., Jones T., Banh J., Carninci P., Chen H., Cheuk R., Chung M.K., Hayashizaki Y., Ishida J., Kamiya A., Kawai Kim C., Lin J., Liu S.X., Narusaka M., Pham P.K., Sakano H., Sakurai T., Sattou M., Seki M., Shinn P., Yamada K., Shinozaki K., Ecker J., Theologis A., Davis R.W., Submitted (NOV-2001) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 463;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Full Length cDNA of gene F5N5.6/AT3922890 (GI:11994718)."; Submitted (JUL-2001) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                         Submitted (AUG-2001) to the EMBL/GenBank/DDBJ databases
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        interPro; IPR002650; ATP-sulfurylase.
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                                                                                                                                                                        'Arabidopsis cDNA clones.
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521 ETKKDLYEPTHGGKVLSMAPGLTSVEIIPFRVAAYNKAKKAMDFYDPARHNEFDFISGTR
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Search Job time

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OM nucleic - nucleic search, using sw model

4, 2003, 14:58:56; Search time 4796 Seconds Run on:

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11195.721 Million cell updates/sec

US-09-898-165B-9 1845 Title: Perfect score: Sequence:

1 atgtcggggatcaagaagca.....ggtccctggagaagaactaa 1845

IDENTITY\_NUC Gapop 10.0 , Gapext 1:0 Scoring table:

2054640 segs, 14551402878 residues Total number of hits satisfying chosen parameters: Searched:

4109280

Minimum DB seq length: '0 Maximum DB seq length: 20000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database

GenEmbl:\*

gb\_ro:\* gb\_sts: gb\_ba:\* gb\_htg:\* gb\_pat: gb\_pr: gb\_ov: gb\_om:

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em\_htgo\_other:\*

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score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

riptio	AF091242 Homo sapi	13907 Homo	AF074331 Homo sapi	AF173365 Homo sapi	AF150754 Homo sapi	AF251/98 Cavia por	AFOOJI44 MUS MUSCU	U34883 Mus musculu	E27970 APS kinase/	AF033026 Homo sapi	AR044160 Sequence	AX281701 Sequence	AF105227 Homo sapi	Y10387 H.sapiens m	AF016496 Homo sapi	U53447 Homo sapien	AF004875 Cavia por	L39001 Urechis cau	AB036852 Ciona int	AY051724 Drosophil	Y12861 D.melanogas	AC018153 Drosophil	AC009382 Drosophil	AE003515 Drosophil	E09951 cDNA encodi	AF016305 Zea mays	U40715 Arabidopsis	U06276 Arabidopsis	AY086101 Arabidops	X79210 A.thaliana	AKI82690 Sequence	AIU95049 AIADIAOPS	AF403233 AIIIUM CE	X79053 S. tuberosu	AF195511 Brassica	X75041 S. tuberosum	AR182691 Sequence	AR182689 Sequence	AY064648 Arabidops	AY091207 Arabidops	
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ALIGNMENTS

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AF091242
LOCUS
DEFINITION
ACCESSION
VERSION
KEYWORDS
SOURCE
ORGANISM

Homo sapiens.

Homo sapiens
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
1 (bases 1 to 2014)
ul Haque, M. F., King, L. M., Krakow, D., Cantor, R. M., Rusiniak, M.E., Swank, R. T., Superti-Furga, A., Haque, S., Abbas, H., Ahmad, W.,
Ahmad, M. and Cohn, D. H.

REFERENCE AUTHORS

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mutations in orthologous genes in human spondyloepimetaphyseal dysplasala and the brachymorphic mouse Nat. Genet. 20 (2), 157-162 (1998)
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ul Haque,M.F., King,L.M., Krakow,D., Cantor,R.M.,
Swank,R.T., Superti-Furga,A., Haque,S., Abbas,H.,
Ahmad,M. and Cohn,D.H.
Direct Submission
Submitted (08-SEP-1998) Pediatrics, Medical Geneti
Research Institute, 8700 Beverly Blvd., Los Angele
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                                                                                        Kurima,K., Singh,B. and Schwartz,N.B.
Genomic organization of the mouse and human genes encoding
sulfurylaas/adenosine 5'-phosphosulfate Kinase isoform SK2
J. Biol. Chem. 274 (47), 33306-33312 (1999)
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/protein_id="AAF12761.1"
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                enzymes
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Location/Qualifiers
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/Organism="Homo sapiens"
//db_xref="taxon:9606"
//chromosom="1"
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A member of a family of sulfate-activating
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Direct Submission
Submitted (28-JUL-1999) Pediatrics, U
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/EC_number="2.7.1.25"
/note="bifunctional enzyme;
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TIKOTHELEVPENKLDHVRAREAETLPSLSITKLDLGWVOULSEGRATPLKGFRREE
YLQVMHFDTLLDGMALPDGVINMS IP IVLPVSAEDKTRLEGCSKFVLAHGGRRVAILR
DAEFYEHRKEERCSYWGTTCTKHPHTKMVMSSGDMIVGGDLQVLEKIRMNDGLDQYR
LTPLELKQKCKEMNADAVFAFQLRNPVHNGHALLMQDTRRRLLERGYKHPVLLLHPLG
GWTKDDDPVDFUDRMKQHAAVLLEGGVLDPKSTTVATFPSPMLAGFTFGVMHPVLLLHPLG
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IAEVAKLFADAGLVCITSFISPFAKDRENARKIHESAGLPFFEIFVDAPLNICESRDV
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5'-phosphosulfate synthase 2b
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/product="3'phosphoadenosine 5'-phosphosulfate synthase
                                                                                                                                                                                                                                                                                                                                        Submitted (25-JAN-2001) Steroid Regulation, National Institute Health, 9000 Rockville Pike, Bethesda, MD 20892-4510, USA Sequence update by submitter on Jan 25, 2001 this sequence version replaced g1:6642928.

Location/Qualifiers
                                            GGAATGCCCCATCCTGAAACCAAGAAGGATCTGTATGAACCCACTCATGGGGGCCAAGGTC
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Venkatachalam, K.V., Fuda, H. and Strott, C.A.
                                                                                    TTGAGCATGGCCCCTGGCCTCACCTCTGTGGAAATCATTCCGATTCCGAGTGGCTGCCTAC
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                             ACCATTGTTGCCATCTTTCCGTCTCCCATGTTATATGCTGGCCCCACAGAGGTCCAGTGG
                                                                                                                                                                                                                                                                 AACAAAGCCAAAAAAGCCATGGACTTCTATGATCCAGCAAGGCACAATGAGTTTGACTTC
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Venkatachalam,K.V., Fuda,H. and Strott,C.A.
Direct Submission
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Catarrhini;
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isoform mRNA, complete cds.
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Mammalla, Eutheria, Primates,
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da 1	1881 ATGGCCCCCAAAGCATGGAAGGTCCTGACATATTATACAGGTCCCTGGAGAAGAACTAA 1940	l B
QY 1	1786 ATGGCCCCCAAAGCATGGAAGGTCCTGACAATTATACAGGTCCCTGGAGAAGAACTAA 1845	Qy
da 1	1821 ATCTCAGGAACTCGAATGAGGAAGCTCGCCCGGGAAGGAGAATCCCCCCAGATGGCTTC 1880	qa
Qy	1726 ATCTCAGGAACTCGAATGAGGAAGCTCGCCCGGAAGAGAGAG	δλ
qa	1761 AACAAAGCCAAAAAAGCCATGAACTTCTATGATCCAGCAAGGCACAATGAGTTTGACTTC 1820	q
QY	1666 AACAAAGCCAAAAAGCCATGGACTTCTATGATCCAGCAAGGCACAATGAGTTTGACTTC 1725	QY
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REFERENCE AUTHORS	1101 CACAGAAAAGAGGAACGCTGTTCCCGTGTTTGGGGGACAAGTGTACAAAACACCCCCCAT 1160	qq
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ORGANISM	981 ATCCCCATTGTACTGCCCGTCTCTGCAGAGGATAAGACACGGCTGGAAGGGTGCAGGAAG 1040	qq
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ACCESSION	841 ATGCACTTTGACACCCTGCTAGA	οy
LOCUS	861 AGCGAAGGCTGGGCCACTCCCCTCAAAGGTTTCATGCGGGAGAAGGAGTACTTACAGGTT 920	qq

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Fuda,H., Shimizu,C. and Strott,C.A. Fuda, H., Shimizu, C. and Struct, .....
Direct Submission
Submitted (11-DEC-2001) Steroid Regulation, NICHD/NIH, Building 49,
Room 6A36, Bethesda, MD 20892-4510, USA
Sequence update by submitter
On Dec 11, 2001 this sequence version replaced gi:7804952.
Location/Qualifiers TIVKCIHELFVPENKLDQVRTEAESLPSLSITKLDLQWVQILSRGWATPLKGFMREKE YLQTLHFDTLLDGMVLRDGVINLSVPIVLPVSADDKARLEGCSEFALMYGGRRVAILC VWLTGLSGAGKTTISFALEEYLMSHAIPCYSLDGDNVRHGLNKNLGFSPGDREENIRR KGLYKRARAGEIKGFTGIDSDYEKPETPECVLKTNLTSVSDCVQQVVELLQEQNILPH IAEVAKLFADAGLVCITSFISPFTKDRENARKIHESAGLPFFEIFIDAPLNICESRDV 11-DEC-2001 68 ATGTCGGGGGTCAAGAAGCAGAAAGCCGAACAGAAATCCACCACAATGTGGTCTAC 127 121 CGAGGATGTACCGTGTGGCTAACAGGTCTCTGGTGCTGGAAAAACAACGATAAGTTTT 180 188 CGGGGATGTACTGTTTGGCTGACAGGTCTTTCTGGTGCTGGGAAAACAACAATAAGCTTT 247 sulfurylase 181 GCCCTGGAGGAGTACCTTGTCTCCCATGCCATCCCTTGTTACTCCCTGGATGGGGACAAT 240 248 GCTCTGGAAGAGTACCTCATGTCCCATGCCATCCCATGCTACTCCCTGGATGGGGAAAT 307 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Rodentia; Hystricognathi; Caviidae; Cavia. (bases 1 to 3480)
Fuda; H., Shimizu, C. and Strott, C.A.
Cloning and expression of guinea pig 3'-phosphoadenosine 5'-phosphosulfate (PAPS) synthase 2
Unpublished 9 1 ATGTCGGGGATCAAGAAGCAAAAGACGGAGAACCAGCAGAAATCCACCAATGTAGTCTAT Gaps /product="adenosine 5'-phosphosulfate kinase/ATP 15; ROD DB 10; Length 3480; AF251798 3480 bp mRNA linear RO cavia porcellus adenosine 5'-phosphosulfate kinase/Art Indels Score 1483; DB 10; Pred. No. 0; 0; Mismatches 210; 1. .3480 /organism="Cavia porcellus" /db\_xref="taxon:10141" /note="gpPAPS synthase 2" /codon\_start=1 922 816 9 2 (bases 1 to 3480) Fuda, H. and Strott, C.A. Direct Submission AF251798.2 GI:17505184 atch 80.4%; cal Similarity 87.9%; 1634; Conservative complete cds 1931. .3464 779 c .1930 .67 Cavia porcellus. 896 2 mRNA, 9 Dp δλ

> RESULT 7 AF251798

1306   CACCCGGTCCTCCTACACCCTCTGGGCGGCTGGACCAAGGATGACGATGTGCCTCTA	1308   ACCOUNTSTREET	OY 1486 CACTGCAGGTCCCGGATGATTGCGGGTGCCAATTTCTACATTGTGGGGAGCGACCCTGCA 154	1628 GGAATGCCCCACCTGAGACCAAGAACTGTATGAACCCACCC	Oy         1666         AACAAGGACAAAAAGCCATGGACTCTATGATTCT           11	Oy 1786 ATGGCCCCCAAAGCATGGAAGTCCTGACAGATTATTACAGGTCCCTGGAGAAGAACTA 1844	RESULT 8 AF085144 LOCUS AF085144 DEFINITION MUS musculus ATP sulfurylase/APS kinase 2 (Atpsk2) mRNA, complete cds.	ACCESSION AF085144 VERSION AF085144.1 GI:4038345 KEYWORDS SOURCE Mus musculus. ORGANISM Mus musculus. Eukarvota: Metazoa: Chordata: Cranlata: Vertebrata: Futeleostomi:	Mammalia; Butheria; Rodentia; Sciurognathi; Muridae; Mus. REFERENCE 1 (bases 1 to 2000) AUTHORS ul Haque, M.F., King, L.M., Krakow, D., Cantor, R.M., Rusiniak, M.E., Swank, R.Y.; Superti-Purga, A., Haque, S., Abbas, H., Ahmad, W.,	TITLE Mutations in orthologous genes in human spondyloepimetaphyseal dysplasia and the brachymorphic mouse JOURNAL Nat. Genet. 20 (2), 157-162 (1998)	PUBMED 9771708  REFERENCE 2 (bases 1 to 2000)  AUTHORS ul Haque,M.F., King,L.M., Krakow,D., Cantor,R.M., Rusiniak,M.E.,  Swank,R.T., Superti-Funda,A., Haque,S., Abbas,H., Ahmad,W.,	edical Geneti	FEATURES Location/Qualifiers source //Organism="Mus musculus" // // // // // // // // // // // // //	/db_xracn:10090" /chromosome="19" /map="32 cM" /tissue_type="spleen"
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Db 1754 TTTATGATCCAGCAAGGCACGAGGAGTTCACTCCAGGAACTCGCATGAGGAAGC 1813  OY 1751 TCGCCCGGGAAGGAGAAATCCCCCAGATGAGCCTCCAAAAGCATGAGGACC 1810	1814 TCGCCCGGGAAGGAGAAGATCCCCCAGATGGCTTCATGGCCCCGAAAGCGTGGAAAGTGT 187	Oy 1811 TGACAGATTATTACAGGTCCCTGGAGAAGTA 1844 		ITION MIS musculus ATP sulfurylase/APS kinase 2 mRNA, complete cds. SION AF052453 ON AF052453 GI:3342265	Mus musculus.  SM Mus musculus Eukaryota Metazoa, Chordata; Craniata, Vertebrata; Euteleo		Z E S	2 (Dass 1 to 1996) Kurima, K. Direct Submission Currect Submission	Maryland Ave. Mc5058, Chicago, IL 60637, USA Location/Qualifiers  ce 11996	/dr_vanism="Mus musculus" /db_xref="taxon:10090" 131. 1996 /EC_number="2.7.7.4"	9 4	subsequent trains. It appropriate group from AFS by APS kinase yielding ADP and 3'-phosphoadenosine-5'-phosphosulfate (PAPS)" //note="bifunctional enzyme"	/product="ATP sulfurylase/APS kinase 2" /protein_id="AAC40191.1" /db_xref="G1:3342266".	LTATALS ALTONS "MEANSKMINKROOVSTRIVYOÄHHYSRIKROOVYOTRIGERGE TVALTOLSGAGKTITSPALEBYLUSTALIPOYSLDGDNYRHGINKROGVYOTREBNIR RIABVARLFADAGLVCITSFISPFAKDRENARKIHESAGLPPFEIFVDAPLMICESRO VKGLYKRARAGEIKGFTGISSDYEKPETBEVLKTHISSSOSCOVOVAUVELLÜGGONIVP UMTIKTIURTEVTURTEVENDARVINGTERA ERMENTETEVITTILSSOSCOVOVAUVENTE	TITOSTILLE FIENCE METANOSTICA DE LICENES TO LEDIZONA VELESCARA LE LANGE RELATOR DE LICENES DE LICEN	COUNT 53	y Match 76.2%; Score 1406.4; DB 10; Length 1996; Local Similarity 85.6%; Pred, No. 0; Pred, 1809.	conservative AAGAAGCAAAAGACGGAG

JOURNAL Submitted (25-AUG-1995) James R. Mensch, Pediatrics, University of Chicago, 5841 S. Maryland Ave. MC5058, Chicago, IL 60637, USA Location/Qualifiers Source /organism="mans musculus" //organism="mans musculus" //organism="mans musculus" //ob_xref="taxon:10090" 34. 1908 //orge="bitunctional enzyme; mediates two steps in sulfate activation: transfer of a sulfate group to ATP by ATP sulfurylase (ATP sulfate adenylyltransferase, EC 2.7.7.4) to yield adenosine 5' phosphosulfate (APS), and the subsequent transfer of a phosphate group from ATP to APS by AFS kinase (ATP adenosine-5' phosphosulfate	3'-phosphotransferase, EC 2.7.1.25) yielding ADP and 3'-phosphodenosine-5'-phosphosulfate (PAPS)"  /codon_start=1 /product="ATP sulfurylase/APS kinase" /product="ATP sulfurylase/APS kinase/APS kinase/APS APS kinase/APS APS APS APS APS APS APS APS APS APS	POLYA_site 2479  polyA_site 2479  Anote="19 A nucleotides"  BASE COUNT 613 a 583 c 667 g 616 t  ORIGIN  Query Match 54.5%; Score 1005; DB 10; Length 2479;  BAST Local Similarity 71.7%; Pred. No. 4.5e-276;  Matches 1317; Conservative 0; Mismatches 520; Indels 0; Gaps 0;	9 GATCAAGAAGCAAAAGCGAGAACCAGCAGAAATCCACCAATGTAGTCTATCAGGCCCA	Db 192 CACAGTTTGGCTGACAGGATTGTCCGGAGCAGGACACGTGAGCATTGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGATGGTTTGGTTTGGATGGTTTGGATGGTTTGTTGTTTGTTGTTTGTTGTTGTTGTTGTTGTTGTTGTTGTTTGTTGTTTGTTGTTTGTTGTTGTTGTTGTTGTG
Db   1225 GATGGAAAGTGGGGACTGGTTGTTGGTGGAGACCTACAGGTGCTAGAGAATAAGGTG 1284     Qy	QY         1317 CCTACTACACCCTCTGGGCGGCTGGACCAAGGATGACGATGACCTCTAGACTGGCGGAT 1376           Db         1465 CCTGCTCCACCCTCTTGGGGCTGGACCAAGGACGATGCCTCTGGAATGGAGT 1524           QY         1377 GAAGCAGCAGCTGTGCTCGAGCAAGGACGATCCCAAGTCAACTTGTTGC 1436           I)         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Oy 1557 TCCTGAAACCAGGATCTGTATGAACCCACTCATGGGGGCAAGGTCTTGAGCATGGC 1616  1705 TCCTGAGACAAAGAAAGAACTATATGAACCCACGGGGGCAAGGTCTTGAGTATGGC 1764  Oy 1617 CCCTGGCCTCACCTGTGGAAATCATTCCATTCCGAGTGCTGCTACACAAAAAAGCCA 1676  I161 CCCTGGCCTCACCTCTGTGGAAATCATTCCATTCCGAGTGCTGCTACAAAAAAAGCCA 1676  I165 CCCTGGCCTTACCTGTGGAAATAATTCCGTTCCGAGTGGCTGCCTACAATAAAATAA 1824  Oy 1677 AAAAGCCATGGACTTCTATGATCCGCACAATGAGTTGACTTCATCTCAGGAAC 1736	1825 AAAGGCATGGACTTTATGATCCAGCACGAGGAGTTTGATTGA	MAUJ4883 LOCUS MAUJ4883 LOCUS ACESSION WAS musculus ATP sulfurylase/APS kinase mRNA, complete cds. ACCESSION UJ4883.1 GI:1109675 WESTWORDS SOURCE ORGANISM MAMMAlia; Eutheria; Rodentia; Craniata; Vertebrata; Euteleostom; Mammalia; Eutheria; Rodentia; Sciurognath; Muridae; Murinae; Mus. REFERENCE 1 (bases 1 to 2479) AUTHORS Li,H., Deyrup,A., Mensch,J.R. Jr., Domowicz,M., Konstantinidis,A.K. and Schwartz,N.B. TITLE Difunctional ATP sulfurylase-adenosine 5'-phosphosulfate kinase bifunctional ATP sulfurylase-adenosine 5'-phosphosulfate kinase MEDLINE 9604345 PUBNED 749384 REFERENCE 2 (bases 1 to 2479) REFERENCE JOURNAL

1632 GAAGGACTCTATGAGCCAACACTGCTGAAGTGCTGACGATGGCCCAGGCCTGAT 1691   1629		ψ.	Local Similarity 71.3%; Score 990; DB 6; Length 1875; Local Similarity 71.3%; Pred. No. 8.66-272;  Local Similarity 71.3%; Pred. No. 8.66-272;  I fill I
8 6 8 6 8 6 8	RESULT 11 E27970 LOCUS DEFINITION ACCESSION VERYWORDS SOURCE ORGANISM REFERENCE AUTHORS TITLE JOURNAL COMMENT	FEATURES SOUIC BASE COUNT	· > 4
	789 CTGGGCCACTCCCCTCAAAGGTTTCATGCGGGAAGGAGTACTTACAGGTTATGCACTT  852 TTGGGCGACTCCTCTGAACGCCTTCATGAGAGAGGAGTACTTGCAGTGCCTCCATTT  849 TGACACCCTGCTAGATGGCGTCATCAAGAGGAGGAGTACTTGCAGTGCCCTCTTT  849 TGACACCCTGCTAGATGACGCTCATCAACTTGCACTCCCCATTGTACTGCCCGTCTC  1	1149 GGACGCGCGCGCGCCCCCCCCCCCCCCCCCCCCCCCCC	1329 TCTGGGGGGTGGACCAAGGATGACCATGACTGGCGGATGAAGCAGCAGGGGGGGG

1299   GGATACCCATAAGCAACTTCTAGAGGGGCTACCGGGGCCCTGTCCTCCTCCTCCTCCTCCTCCTCCTCCTC	RESULT 12 AF033026 LOCUGS DEFINITION Homo sapiens bifunctional AFP sulfurylase/adenosine S'-phosphosulfate kinase mRNA, complete cds. AF033026 AF0MEDLINE BENERANCE I (bases 1to 2265) AF0MEDLINE BIOSCI. Biotechnol. Biochem. 62 (5), 1037-1040 (1998) BENERANCE AFFRENCE AFFREN
	789 CTGGGCCACTCCCCTCAAAGGTTTCATGCGGCAGAAGGAGTACTTACAGGTTATGCACTC 819 TTGGGCAACCCCTTCAATGCTTTATGAGAGGGAGTACTTGCAGTGCTTCATTT 878 819 TTGGGCAACCCCATTGAATGCTTTATGAGAGGGAGTACTTGCAGTGCCTTCATTT 878 819 TGACACCCTGCTAGATGCTTTATGAGAGGGAGTACTTGCAGTGCCTTCTTT 878 819 TGACACCCTGCTAGATGCTTGAACTTGACTTCCCCATTGTACTTGCCTCTC 908 819 TGACTGCTTCTCGAATGCTTGAACTTGTACTTGACTTTATGATCTTCCCATTGCTCCCTCTC 908 910 TGCAGAGGATAAGACAGGCTGGAAGGTGCAGTTTGTACTTTTTTTT

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qa 	QQ DP	QV	QY	QY	Qy	QY	QY Db	da Db	oy Ob	QY	QY	QY	QY Db	QY	qq VQ	Qy	Qy	Qy
Db 1865 GCTGACAGAATACTACAAATCCTTGGAGAA 1894	dq 9052.	Sequence 4 110H patent 05 381/ 8R044160 1 GI:5965625	NISM NCE ORS	Corley, N.C. Disease related nucleotide kinases Patent: US 5817482-A 4 06-0CT-1998;	rce	Ouery Match 53.7%; Score 990; DB 6; Length 2506; Best Local Similarity 71.3%; Pred. No. 8.9e-272; Matches 1305; Conservative 0; Mismatches 5.25; Indels 0; Gans 0;	THE ARGARD CONTROLL OF THE	Qy 69 CCATGTGAGCAGGAATAAQAGGGCAAGTGGTTGGAACAAGGGGTGGGTTCCGAGGATG 128 	TACCGTGTGGCTAACAGGTCTCTGGTGCTGGAAAACAACGATAAGTTTTGCCCTGGA 	189 GGAGTACCTTGTCCCATGCCATCCCTTGTTACTCCCTGGATGGGGACAATGTCCGTCA			369 TCCATTCGCAAAGGATCGTCAGAAATCCCCGCAAAATCATCAGAGGGTGCCATT  1 11 1 11 1 11 11 11 11 11 11 11 11 11			GAAACCTGAAACTCCTGAGCGTGTGCTTAAAACCAATTTGTCCACAGTGAGTG	609 CCACCAGGTAGTGGAACTTCTGCAGAACATTGTACCTATACTATAATCAAAGA	DD 6/4 CCAGCAAGTIGIGGAACTICIACAGGAACGGGATAIIGIACCIGIGGAIGCAICITAIGA 733 Qy 669 TAICCACGAAACICITIGIGCCGGAAAACAAACIIGACCACGICCGAGCIGAGACIGAAAC 728

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AVFAFOLRNPVHNGHALLMQDTHKQLLERGYRRPVLLLHPLGGWTKDDDVPLMWRMKQ
HAAVLEEGVLNPETTVVAIFPSPMMYAGPTEVOWHCRARMVAGANFYIVGRDPAGMPH
PETGKOLYEPSHGAKVLTMAPOLITLEIVPFRYAAYNKKKRMDYYDSEHHEDFEFIS
GTGRKRLARGQRPPERAPKAMTVLTEYYKSLEKA"
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                        DGGVINLSVPIVLTATHEDKERLDGCTAFALMYEGRRVAILRNPEFFEHRKEERCARQ
WGTTCKNHPYIKMVMEQGDWLIGGDLQVLDRVYWNDGLDQYRLTPTELKQKFKDMNAD
      PENKLHLAKTDAETLPALKINKVDMQWVQVLAEGWATPLNGFMREREYLQCLHFDCLL
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                                                                                                                                                                                                                                                                                                                                                                                                                  156 TGCTGGAAAAACAACGATAAGTTTTGCCCTGGAGGAGTACCTTGTCTCCCATGCCATCCC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             576 TAAAACCAATTTGTCCACAGTGAGTGACTGTGTCCACCAGGTAGTGGAACTTCTGCAAGA
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Pred. No. 2.2e-271;
0; Mismatches 509;
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Best Local Similarity 71.8%;
Matches 1294; Conservative
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TYGSMALESTLUCHGTEVTTLDGDUFNTGGSFSBEDRENVRATAEVAKLEADA
GLVGTTSFTSPTYDFNARQIHEGASLPFFEVFUTAPLHVCEQRDVKGLXKKARAGE
IKGFTGIDSEYEKPEAPELVLKTDSCDVNDCVQQVVELLQERDIVPVDASYEVKELYV
                                                                                                                                                                                                                                                                                                                                                   BUCULI392 2430 bp mRNA linear PRI 30-JUL-2001 Homo sapiens, Similar to PAPS synthetase, clone MGC:9898 IMAGE:3869484, mRNA, complete cds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        be found
CACTITGGAAATAGTICCCTITCGAGIIGCAGCITACAACAAGAAAAAGAAGCGTAIGGA 1899
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Direct Submission
Submitted (15-ULL-2001) National Institutes of Health, Mammalian
Gene Collection (MCC), Cancer Genomics Office, National Cancer
Institute, 31 Center Drive, Room 11A03, Bethesda, MD 20892-2590,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Clone distribution: MGC clone distribution information can be four through the I.M.A.G.E. Consortium/LLNL at: http://image.llnl.gov Series: IRAK Plate: 13 Row: i.Column: 18 This clone was selected for full length sequencing because it passed the following selection criteria: Hexamer frequency ORF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       `.
3
                                            CTTCTATGATCCAGCAAGGCACAATGAGTTTGACTTCATCTCAGGAACTCGAATGAGGAA
                                                                                   GCTCGCCCGGGAAGGAGAATCCCCCAGATGGCTTCATGGCCCCCCAAAGCATGGAAGGT
                                                                                                                                                      Lu, X., G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cDNA Library Preparation: Life Technologies, Inc. cDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL) DNA Sequencing by: Baylor College of Medicine Human Genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Web site: http://www.hgsc.bcm.tmc.edu/cdna/
Contact: villalon@bcm.tmc.edu.
Villalon, D.K., Luna, R.A., Hale, S.M., Hulyk, S., I
A.M., Holloway, M., Telford, B, Hodgson, A., Bouck,
Muzny, D.M., Gibbs, R.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product-"Similar to PAPS synthetase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NIH-MGC Project URL: http://mgc.nci.nih.gov
Contact: MGC help desk
Email: cgapbs-remail.nih.gov
Tissue Procurement: ATCC
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/clone_lib="NIH_MGC_67"
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/db_xref="GI:15030252"
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/db_xref="taxon:9606"
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Mammalia; Eutheria; Primates;
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KEYWORDS
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JOURNAL
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6 GTGCAGCAGTTTGTCCTGGCACATGGTGGACGGAGGGTAGCTATCTTACGAGACGCTGA 	6 ATTCTATGAACACAGAAAAGAGGAACGCTGTTCCCGTGTTTGGGGGACAACATGTACAAA	6 ACACCCCCATATCAAAATGGTGAAAGTGGGGACTGGCTGG	5 GGTGCTGGAGAAAATÀAGATGGATGATGGCCTGGACCAATACCGTCTGACACCTCTGGA 	GCTCAAACAGAAATGTAAAGAAATGAATGCTGATGCGGTGTTTGCATTCCAGTTGGCGAA 	TCCTGTCCACAATGGCCATGCCCTGTTGATGCAGGACACCTGCCGCAGGCTCCTAGAGAG	GGGCTACAAGCACCCGGTCCTACTACACCCTCTGGGCGGCTGGACCAAGATGACGA 	TGTGCCTCTAGACTGGCGGATGAAGCAGCAGGGGCTGTGCTCGAGGAGGGGTCCTGGA 	TCCCAAGTCAACCATGTTGCCATCTTTCCGTCTCCCATGTTATATGCTGGCCCCACAGA	GGTCCAGTGGCACTGCAGGTCCCGGATGATTGCGGGTGCCAATTTCTACATTGTGGGGAG	GGACCCTGCAGGAATGCCCCATCCTGAAACCAAGAAGGATCTGTATGAACCCACTCATGG 	9 1		GTTTGACTTCATCTCAGGAACTCGAATGAGGAAGCTCGCCGGGAAGGAGAGATCCCCC		8 - 8	
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Search completed: June 4, 2003, 16:43:26 Job time: 4822 secs

Arabidopsis thalia SAMS promoter::ATP

Human colon cancer Human colon cancer

Arabidopsis

Arabidopsis thalia Arabidopsis thalia Arabidopsis thalia

Gene #360 used to Human adenosine 5' Human breast cance

Human breast cance Human breast cance Human breast cance Human breast cance Human immune/haema Human secreted pro

Human breast cance

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Transferase; TRNSFS-6; human; antitumour; cancer; inflammation; gastrointestinal disorder; developmental disorder: genetic disorder; neurological disorder; reproductive disorder; smooth muscle disorder; immunological disorder; gene therapy; diagnosis; ATP sulfurylase/APS kinase 2; ss.
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                                                                                                                                                                                         The present sequence is that of cDNA clone 1420940CB1 encoding human transferase TRNSFS-6 (see AAY79214), 1 of 15 claimed human transferase proteins of the invention (see AAY79209-23). The clone was isolated from foetal kidney cDNA library KIDNNOT09. TRNSFS-6 is expressed in cardiovascular, gastrointestinal, reproductive and endocrine tissues, especially those associated with cancer, inflammation and cell proliferation. It shows homology to ATP sulfurylase/APS kinase 2. A polynucleotide comprising nucleotides 942-986 of the present sequence can be used as a DNA probe. The
                                                                                                                                                                                                                                                                                                                  new human transferase proteins and the polynucleotides encoding them can be used in the diagnosis, prevention and treatment (including gene therapy and antisense therapy) of cancer,
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                                                                              TCCCATGTTATATGCTGGCCCCACAGAGGTCCAGTGGCACTGCAGGTCCCGGATGATTGC 1508
                                                                                                              1509 GGGTGCCAATTTCTACATTGTGGGGAGGGACCCTGCAGGAATGCCCCATCCTGAAACCAA 1568
                                                                                                                                                      CACTTTGGAAATAGTTCCCTTTCGAGTTGCAGCTTACAACAAGAAAAAGAGCGTATGGA 1718
                                                                                                                                                                                                                                                                                                                                                                                                 Human disease related nucleotide kinase-2; DRNK-2; deoxyguanosine kinase;
p2lras; cell proliferation; oncogenesis; cancer; gene therapy;
immune disorder; neurological dysfunction; ss.
                                                       GGCTGTGCTCGAGGGGTCCTGGATCCCAAGTCAACCATTGTTGCCATCTTTCCGTC
                                                                                                                       GAAGGATCTGTATGAACCCACTCATGGGGGCAAGGTCTTGAGCATGGCCCCCTGGCCTCAC
                TCTGGGCGCCTGGACCAAGGATGACGATGTGCCTCTAGACTGGCGGGATGAAGCAGCACGC
                                                                                                                                                                              CTCTGTGGAAATCATTCCATTCCGAGTGGCTGCCTACAACAAAAAGCCATGGA
                                                                                                                                                                                                             CTTCTATGATCCAGCAAGGCACAATGAGTTTGACTTCATCTCAGGAACTCGAATGAGGAA
                                                                                                                                                                                                                                            1749 GCTCGCCCGGGAAGGAGAATCCCCCAGATGGCTTCATGGCCCCCAAAGCATGGAAGGT
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/*tag= a
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The present sequence represents a human disease related nucleotide
Kinase-2 (DRNK-2) DNA sequence first identified in Incyte Clone
373887 from the lung tissue CDNA library (LUNGNOT 02). The DNKR-2 DNA
sequence is useful for the production of the corresponding recombinant
sequence is useful for the production of the corresponding recombinant
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corresponding nucleoside triphosphate. As GTP levels are known to
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corresponding nucleoside triphosphate. As GTP levels are known to
correct the activity of certain oncogenic proteins of opposite protein of activity causes high ratios of GTP:GDP, promoting oncogenesis.

Correctore, diseases (e.g. cancers, immune disorders and neurological
correctored with the recombinant enzyme, or by gene therapy based strategies.

Anti-sense constructs of the DNKR encoding nucleic acids may also be
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                                                                  Nucleic acids encoding de:oxy:guanosine kinase - useful for recombinant production of the enzyme for treating diseases callack of the enzyme e.g. cancers caused through loss of enzyme
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Pred. No. 6.4e-295;
0; Mismatches 525;
                                                                                                                                                                                                                                                              Examples; Fig 2A-2G; 53pp; English.
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illarity 71.3%;
Conservative 0
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Matches 1305; Conserv
P-PSDB; AAW70494.
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1808

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Human; secreted protein; fusion protein; gene therapy; protein therapy; diagnosis; tissue; cancer; tumour; neurodegenerative disorder; leukaemia; developmental abnormality; foetal deficiency; blood; allergy; renal; ds; immune system; asthma; lymphocytic disease; brain; hepatic; Lymphoma; inflammation; ischaemic shock; Alzheimer's disease; restenosis; AIDS; cognitive disorder; schizophrenia; prostate; obsecolast; thymus; osteoporosis; arthritis; testis; lung; thyroid!tis; thyroid; digestion; endocrine; metabolism; regulation; malabsorption; gastritis; neoplasm.
                                 GCTCGCCCGGGAAGGAGAATCCCCCAGATGGCTTCATGGCCCCCCAAAGCATGGAAGGT
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Lafleur DW, Moore PA,
Shi Y, Young P;
                                                                                      1875 GCTGACAGAATACTACAAATCCTTGGAGAA
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970S-0048186.
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Ruben SM
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                    CCAGCAAGTTGTGGAACTTCTACAGGAACGGGATATTGTACCTGTGGATGCATCTTATGA
                                         TATCCACGAACTCTTTGTGCCGGAAAACAAACTTGACCACGTCCGAGCTGAGGAAC
                                                      AGTAAAAGAACTATATGTGCCCAGAAAATAAACTTCATTTGGCAAAAAACAGATGCGGAAAC
                                                                                    TCTCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGGTTTTGAGCGAAGG
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HS; Olsen

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This sequence represents a nucleic acid molecule which encodes a secreted human protein. The gene number, and the clone it is derived from, are detailed in the descriptor line. The gene can be used to generate fusion proteins by linking to the gene to a human immunoglobulin FC portion (e.g. AAX00602) for increasing the stability of the fused The invention relates to 87 novel genes and their fragments (nucleic acid sequences: AAX00611-X00724; amino acid sequences AAX0611-X00724; amino acid sequences AAX0611-X00724; amino acid sequences AAX061001-X00724; amino acid sequences AAX061001-X00724; amino acid sequences appropriate medical conditions e.g. by protein or gene therapy. Also, pathological conditions can be diagnosed by determining the amount of the new polypeptides in sample or by determining the presence of mutations in the new polyvucieotides. Specific uses are described for each of the 87 polynucleotides, based on which tissues they are most highly expressed in
  immune diseases, inflammation or blood disorders
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                                                        Page 265-267; 385pp;
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English.

Sequence 2527 BP; 706 A; 508 C; 597 G; 716 T; 0 other;

128 248 308 TACCGTGTGCCTAACAGGTCTCTCTGGTGCTGGAAAAACAACGATAAGTTTTGCCCTGGA 188 333 393 368 453 428 488 573 809 899 813 GATCAAGAAGCAAAAGACGGAGAACCAGCAGAAATCCACCAATGTAGTCTATCAGGCCCCA GGAGTACCTTGTCCCCATGCCATCCCTTGTTACTCCCTGGATGGGGGACAATGTCCGTCA TGGCCTTAACAGAAATCTCGGATTCTCCTGGGGACAGAGGAAAATATCCGCCGGAT AGGTCTCAATAAAAATCTTGGCTTTAGTCCTGAAGACAGAGAAGAAGAATGTTCGACGCAT CGCAGAAGTTGCTAAACTGTTTGCAGATGCTGGCTTAGTGTGCACATCACAAGTTTCATATC CTATAAAAGGGCCAGAGCTGGGGAGATTAAAGGATTTACAGGTATTGATTCTGATTATGA CCAGCAAGTTGTGGAACTTCTACAGGAACGGGATATTGTACCTGTGGATGCATCTTATGA AGTAAAAGAACTATATGTGCCAGAAAATAAACTTCATTTGGCAAAAACAGATGCGGAAAC TCCATTCGCAAAGGATCGTGAGAATGCCCGCAAAATACATGAATCAGCAGGGCTGCCATT CTTTGAAATATTTGTAGATGCACCTCTAAATATTTGTGAAAGCAGAGACGTAAAAGGCCT TTTTGAAGTATTTGTTGATGCTCCTCTGCATGTTTGTGAACAGAGGGATGTCAAAGGACT AAAGCCAGAGGCCCCTGAGTTGGTGCTGAAAACAGACTCCTGTGATGTAAATGACTGTGT CCACCAGGTAGTGGAACTTCTGCAAGAGCAGAACATTGTACCCTATACTATAATCAAAGA TATCCACGAACTCTTTGTGCCGGAAAACAACTTGACCACGTCCGAGCTGAGGCTGAAAC Gaps ; Length 2527; Indels , DB 20; 1 6.4e-295; ches 525; Score 990; DB Pred. No. 6.4e. 0; Mismatches 0 53.7**%**; 71.3**%**; Conservative Similarity Best Local Sim: Matches 1305; 6 129 249 334 454 69 189 274 394 429 574 549 514 694 754 Query a g δ Op g qq ò à 셤 δ ò δ ò . d Qγ ò g g οy g οy g δ

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generate fusion proteins by linking to the gene to a human immunoglobulin Pc portion (e.g. AAX00602) for increasing the stability of the fused protein as compared to the human protein only.

The invention relates to 87 novel genes and their fragments (nucleic acid sequences: AAX00611-X00724; amino acid sequences AAX06011-X00724; amino acid sequences AAX06004) which are useful for preventing, treating or ameliorating medical conditions e.g. by protein or gene therapy. Also, pathological conditions can be diagnosed by determining the amount of the new polypeptides in a sample or by determining the presence of mutations in the new polynucleotides. Specific uses are described for each of the 87 polynucleotides, based on which tissues they are most highly expressed in
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Ni J, Olsen HS;
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Lafleur DW, Moore PA,
, Shi Y, Young P;
                       Claim 1; Page 234-236; 385pp; English
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249 TGGCCTTAACAGAAATCTCGGATTCTCTCTGGGGACAGAGGAAAATATCCGCCGGAT 308
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The present invention relates to the isolation of human polynucleotide sequences that are differentially expressed during foam cell differentiation. The polynucleotide sequences of the invention or a composition comprising these polynucleotides are useful as a high throughput method for detecting altered expression of one or more polynucleotides in a sample. The polynucleotides can be used in the diagnosis of disorders associated with foam cell development such as atheroscierosis, cerebral stroke, and cardiovascular disorders such as PCR primers and probes. The polynucleotide sequences can also be used as PCR primers and probes. The polynucleotides of the invention are als bolynucleotide sequences of the invention are als polynucleotide sequences of the invention which are differentially expressed during foam cell differentiation.
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                                                     Human; foam cell differentiation; atherosclerosis; cerebral stroke; cardiovascular disorder; coronary artery disease; gene therapy; ds.
during foam cell differentiation
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Pred. No. 6.6e-295;
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Human DNA sequence #110 expressed
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		429 CITIGAAATATITGTAGATGCACCTCTAAATATITGTGAAAGCAGAGGCGTAAAAGGCCT 488 	489 CTATAAAAGGGCCAGAGCTGGGGAGATTAAAGGATTTACAGGTATTGATTCTGATTATGA 548	549 GAAACCTGAAACTCCTGAGCGTGTGCTTAAAACCAATTTGTCCACAGTGAGTG	609 CCACCAGGTAGTGGAACTTCTGCAAGAGCAGAACATTGTACCCTATACTATAATCAAAGA 668	669 TATCCACGAACTCTTTGTGCCGGAAACAAACTTGACCAGGTCCGAGCTGAGGCTGAAAC 728	729 TCTCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGGTTTTGAGCGAAGG 788	789 CTGGGCCACTCCCTCAAAGGTTTCATGCGGGAGAAGGAGTACTTACAGGTTATGCACTT 848 	849. TGACACCCTGCTAGATGACGTGATCAACATGGAGCATCCCCGTTGTACTGCCCGTCTC 908		TCATGAAGATAAAGAGACTGGACGGCTGTACAGCATTGCTCTGATGAGGGCCG	909 GAGGGGGCATCTTCCTGGAGGGGGGGGGGGGGGGGGGGG	1029 CCGTGTTTGGGGGACAACATGTACAAAACACCCCCATATCAAAATGGTGATGGAAAGTGG 1088	GGACTGGCTTGGTGGAGACCTTCAGGTGCTGGAGAAATAAGATGGAATGATGGCCT		1149 GGACCAATACCGTCTGACACCTCTGGAGCTCAAACAGAAATGTAAAGAAATGAATG	TGCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCACAATGCCTTTGATGCA	1420 TGCTGTCTTTGCATTCAACTACGCAACCCAGTGCAATGGACATGCCCTGTTAATGCA 1479	GGATACCCATAAGCAACTTCTAGAGGGGCTACCGGGGGCCCTGTCCTCCACCC	1329 TCTGGGCGGCTGGACCAAGGATGACGATGTGCCTCTAGACTGGCGGATGAAGCAGCACGC 1388

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                                                                                                                       Gaps
                                      The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from at ftp.wipo.int/pub/published_pct_sequences.
insecticides, therapeutics and pharmaceutical drugs. The invention discloses genomic DNA sequences (ABL16176-ABL30511), expressed DNA sequences (ABL01840-ABL16175) and the encoded proteins
                                                                                                                     33;
                                                                                                                     Indels
                                                                                                   Length
                                                                              532 T; 0 other;
                                                                                                Score 634; DB 23;
Pred. No. 7.8e-185;
0; Mismatches 695;
                                                                             2463 BP; 579 A; 667 C; 685 G;
                                                                                                Query Match 34.4%;
Best Local Similarity 60.7%;
Matches 1124; Conservative C
                               (ABB57737-ABB72072)
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                                                                                                                                                                                                                                                                                                                                and cell-cell
                                                                                                                                                                                                                                                                                                                                                                                          The invention relates to an isolated nucleic acid detection reagent capable of detecting 1000 or more genes from Drosophila. The invention useful in developmental biology and in elucidating cell signalling and cell-cell interactions in higher eukaryotes for the development of insecticides, therapeutics and pharmaceutical drugs. The invention discloses genomic DNA sequences (ABL16176-ABL30511), expressed DNA
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                                       developmental biology; cell signalling; insecticide;
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                                                                                                                                                                                                                                                                                                                                                                     Claim 1; SEQ ID NO 40471; 21pp + Sequence Listing; English.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                discloses genomic DNA sequences (ABL16176-ABL30511), exsequences (ABL01840-ABL16175) and the encoded proteins (ABB57737-ABB72072).
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Pred. No. 2.5e-149;
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              melanogaster genomic
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Best Local Similarity 58.7%;
Matches 1056; Conservative
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11-JUL-2000; 2000US-0614150.
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1555 IAGCCGARAGCCATGGACTTCTTTTAGATCCTGCCCTTCCGTGTTGCTGTT 1496  1666 AACAAAGCCAAAAAAGCCATGGACTTCTATGATCCAGCAAGGCAAATGAGTTGACTTC 1725  1495 GACAAGAGCGCAGTAGAATGGCTTTTCTAGAGCCAAGAGGAAAAAAAA	QY 276 TCCTGGGGACAGAGAAAATATCCGCCGGATTGCTGAGGTGGCTAAGCTGTTTGCTGA 335
ATCTCAGGAACTCGAATGAGGAAGCTCGCCGGGAAGGAGAAATCCCCCCAGATGGCTTC	9y 336 TGCTGGTCTGCATTACCAGCTTTATTTCTCCATTCGCAAAGGATCGTGAGAATGC 395
ATGCCCCCAAAGCATGGAAGGTCCTGACAATAATAACAGGTCCCTGGAGAACAAA	OY 396 CCGCAAAATACATGAATCAGCAGGCTGCCATTCTTTGAAATATTGTAGATGCACCTCT 455
	QY 456 AAATATTTGTGAAAGCGGTAAAAGGCCTCTATAAAAGGGCCAGAGCTGGGGAGAT 515 
AAT04849 standard; cDNA to mRNA; 990 BP.	Qy 516 TAAAGGATTTACAGGTATTGATTATGAGAAACCTGAAACTCCTGAGCGTGTGCT 575
AAT04849;	Db 483 TAAAGGTTTCACTGGGATCGATTCTGAATATGAAAAGCCAGAGGCCCCTGAGTTGGTGCT 542
28-MAY-1996 (first entry) Human adenosine 5' phosphosulphate kinase 990 bp gene fragment.	OY 576 TAAAACCAATTGTCCACAGGGGGGGGGGGGGGGGGGGGG
. Phosphosulphate kinase; genetic disease; diagnosis; probe; ds.	
Homo sapiens.	Db 603 ACGGGATATTGTACCTGTGGATCTTATGAAGTAAAAAAAA
JP07250687-A. , , , , , , , , , , , , , , , , , , ,	696 CAAACTIGACCACGICCGAGCTGAGGCTGAAACTCTCCCTTCATTATCAATTACTAAGCT
14-MAR-1994; 94JP-0069861.	DD 003 TAMACTICATITGCCAAAAAACAGATTACCAGAAACTGCCACACCCACAAAATTAATAAGT 722 0v 756 GGATCTCCAGTGGGTCCAGGTTTTGAGCAAGGCTGGGCCACTCCCACAAGGTTTCAT 815
14-MAR-1994; 94JP-0069861.	723 GGATATGCAGTGCAGGTTTTGCAGAAGGTTGGGCAACCCCATTGAATGGCTTTAT 78
(NIRA ) UNITIKA LTD.	816 GCGGGGGAGAAGGACTAACAGGTTATGCACTTTGACACCCTGCTAGATGATGGCGTGAT 87
1; 1950-3/04/2/48. The framework of the first of the firs	Db 783 GAGAGAGAGGAGTACTTGCATTTTTGATTGTCTTCTGGATGAGGGTGTCAT 842 Qy 876 CAACATGAGCATTGTACTGCCGTCTCTGCAGAGATAAGACACGGTGGAAGG 935
netic disease and for the produ	
Claim 1; Page 6; 6pp; Japanese. AAT04849 and AAT04850 are fragments of the human adenosine 5'	QY 936 GTGCAGCAAGTTTGTCCTGGCACATGGTGGACGGGGGTAGCTATCTTACGAGACGCTGA 995
phosphosulphate kinase (5' PSK) of 990 and 600 bp respectively. Arrey may be used as probes for the detection of genetic disease. The 990 bp fragment may also be used for low cost prodn. of human 5' PSK.	996 ATTCTATGAACACAGAAAGGAACGC 1023
Sequence 990 BP; 281 A; 182 C; 267 G; 260 T; 0 other;	DD 962 GTTTTTGACCACACGGACGCCC 989
Ouery Match 26.3%; Score 484.8; DB 16; Length 990; Best Local Similarity 68.8%; Pred. No. 6.2e-139; Matches 680; Conservative 0; Mismatches 307; Indels 1; Gaps 1;	RESULT 10 AAC34705 UD AAC34705 standard; DNA; 1695 BP.
. 36 GCAGAAATCCACCAATGTAGTCTATCAGGCCCACCATGTGAGCAGAATAAGAGGGGGCA 95 	AX AX AC AAC34705; XX DT 17-OCT-2000 (first entry)
96 AGTGGTTGGAACAAGGGGTTCCGAGGATGTACCGTGTGGCTAACAGGTCTGTGG 155 	AX Ax DE Arabidopsis thaliana DNA fragment SEQ ID NO: 7588.  XX XX Hybridisation assay; genetic mapping; gene expression control;

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99US-0141842.
99US-0142154.
99US-0142055.
99US-0142390.
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99US-0142920.
99US-0142977.
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99US-0148341.
99US-0148565.
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99US-0149368.
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28 JUN - 1999;
29 JUN - 1999;
30 JUN - 1999;
01 JUL - 1999;
02 JUL - 1999;
06 JUL - 1999;
06 JUL - 1999;
12 JUL - 1999;
12 JUL - 1999;
13 JUL - 1999;
14 JUL - 1999;
15 JUL - 1999;
metabolic pathway; promoter; termination sequence; ss.
                                                                                                                          99US-0121825.
99US-0123548
99US-0125788.
99US-0125787.
99US-0126785.
99US-0127462.
99US-0128714.
99US-0128714.
99US-0129845.
99US-013077.
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99US-013421
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                          Arabidopsis thaliana
                                                                                                  25-FEB-2000;
                                              EP1033405-A2.
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Qy         1027 TCCCGTGTTTGGGGGACAACATGTACAAACACCCCCATAT CAAAATGGTGATGGAA 1083           Db         672 GCTAGAACTTGGGGAACTACTTCCCAGGATTGCCTTATGTGGAAGATATTACTCCA 731           Qy         1084 AGTGGGGACTGGCTGGTGGAGACCTTCAGGTGGAGAAATAAGATGGAATGAT 1143           Db         732 TCTGGAAACTGGCTGGTGGAGACCTTTAGAACGAGATAAGATAACGAT 791           Qy         1144 GGGCTGGAACTGGCTGATTGGTGGTGTTTTAGAACTAAAGAATAACATT 791           Qy         1144 GGGCTGGACCACTCTGACACCTCTGGAGCTCAAACAGAAATGAAT 1203	QY         1204 GCTGATGCGGTTTGCGTTGCGCAATCCTGTCCACAATGGCCATGCCCTGTTG 1263           I	OY 1324 CACCTCTGGGCGGTGGACCAAGGATGTGCCTCTAGACTGGAGCGGTGAAGCAG 1383	Qy         1444 CCGTCTCCCATGTTATATGCTGCCCCACAGAGGTCCAGTGCAGGTCCCGGATG 1503           Db         1092 CCGTCACCGATGCTATATGCTGCTCCAACTGAAGTTCAATGGCACGCCAAGGATT 1151           Qy         1504 ATTGCGGTGCCAATTCTACATTGTGGGAGGAGGGAGGAATGCCCCAACCTGAA         1563 TCCTGAGATTCTACATTGTGGGAGGAGGAGGAATGCCCAACCTGAA           Db         1152 AACGCTGCTGCTAATTTCTACATTGTAGATCTGAAGATCCTGCAGGAATGGGCCACCCTACTTATTCTACATTGTAGATCTGAATCTTCTACAATTGTAGATCTGAACCTGCAGGAATGGGCCACCCTACTTATTCTACATTGTAGATCTGAATCTTCTACAATTGTAGATCTACAATGCTACCAACGATGGGCCACCCTACTTATTTCTACATTGTAGATCTTCTACAATTGTAGATCTTACAATTGTAGATCTTCTACAATTGTAGATCTTCTACAATTGTAGATCTTACAATTGTAGATCTTCTACAATTGTAGATCTTCTACAATTGTAGATTGTAGATCTTCTACAATTGTAGATCTTCTACAATTGTAGATCTTCTACAATTGTAGATCTTCTACAATTGTAGATCTTCTACAATTGTAGATCTTCTACAATTGTAGATTGTAGATTGTAGATCTTCTACAATTGTAGATTGTAGATCTTCTACAATTGTAGATCTTACAATTGTAGATCTTACAATTGTAGATCTTACAATTGTAGATTGTAGATCTTACAATTGTAGATCTTACAATTGTAGATCTACAATTGTAGATTACTACAATTGTAGATTACTACAATTGTAGAATTGTAGATCTACAATTGTAGATTACTACAATTGTAGAATTGTAGATCTACAATTGTAGATTACTACAATTGTAGAAT	1564 ACCAAGAAGGATCTGTATGAACCCACTCATGGGGGAAGGTCTTGAGCATGGCCCTGGC	Oy 1684 ATGGACTTCTATGATCCAGCAAGGACAATGAGTTTGATCTTCATGGAACTCGAATG 1743	RESULT 11 AAA51055 ID AAA51055 ID AAA51055 ID AAA51055 ID AAA51055; XX AC AAA51055; XX DT 09-OCT-2000 (first entry) XX DE SAMS promoter::ATPS DNA fragment. XX KW S-adenosyl-L-methionine synthetase; SAMS; probe; promoter; embryo; KW Constitutive; tissue-specific; development.specific; ATP synthase; XX KW ATPS; herbicide resistance; pathogen resistance; ss. XX CONSTITUTION OF THE CONST
				, 1 %	Gaps 3; TCCCT. 735 1   1   1 TGCCT 371 GGGCC 795 GGGCT 791	ACTOT TIGAT TIGAT AGGA COTOT TIGAT AGGA
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		÷			re 384; DB 21; dd. No. 1.3e-107; Mismatches 465; ACTTGACCACGTCCGA   III   IIII   IIIII   IIII   IIII   IIII   IIII   IIII   IIII   IIII   IIII   IIIII   IIII   IIII   IIII   IIII   IIII   IIII   IIII   IIII   IIIII   IIIII   IIII   IIIII   IIII   IIII   IIII   IIII   IIII   IIII   IIII   IIII   IIIII   IIII   IIIII   IIIII   IIIII   IIIII   IIII   IIII   IIII   IIII   IIIII   IIII   IIII   IIIII   IIII   IIIII   IIII   IIIII   IIIII   IIIII   IIII   IIII   IIIII   IIIII   IIII   IIII   IIII   IIIII	CAAAGGTTTCATGCGGAGAAGGAGTACTTACAGGTTAT
990S-0153070. 990S-0153788. 990S-0154018. 990S-0154039. 990S-0155139. 990S-0155639. 990S-0155639. 990S-0155659.	9905-0157753, 9905-0157865. 9905-0158029. 9905-015823. 9905-015829. 9905-0159294.	99US-0155329. 99US-0155330. 99US-0155331. 99US-015633. 99US-0155538. 99US-0160781.	9905-0160708. 9905-0160710. 9905-0160814. 9905-0160815. 9905-0160980. 9905-0160981.	99US-0161405. 99US-0161406. 99US-0161360. 99US-0161360. 99US-0161361. 99US-016192. 99US-0161992.	20.8%; Scc 59.6%; Pre 59.6%; Pre GTGCCGAAACA 11	ACTCCCCTCAAAGGTTCATGCGGGAGAAGGAGTATTACAAGGTTATGCAATTTGCAACTTTGCAAAGGTTATGCAAAGGTTATGCAAAGTTATGCAAAGTTATGCAAAGTTATGCAAAGTTATGCAAAGTTTAGAAAGTTTTAGTTTAGTATTTTAATTTGTTTAAAAGTTTTAATTTGTTTTAATTTGTTTAAAAAGGTTATGCATTTTAATTTGTTTTTTAAAAATGTTTTTAATTTGTTTAAAAAA
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1438 2269

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1910 CCAATGCTGGAAATTGGTTGATTGGGGGTGACCTAGAGGTCAFTGAACCAATTCAGTACA 1969
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                                                                                                                                                                                                                                                                                                                                                                                                                                                         2270 TATTCCCATCTCCCATGCACTATGCTGGACCCACGGAGGTGCAGGCATGCCAAAGGCTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mapping;
                                                         2030 GCAATGCGGGATGCTGTGTTTGCCTTCCAGCTCCGGAATCCTGTTCACAATGGCCATGCTT
                                                                                                                                                                                                                      1319 TACTACACCCTCTGGGCGGCTGGACCAAGGATGACGATGTGCCTCTAGACTGGCGGATGA
                                                                                                                                                                                                                                                                                                                                                                             TCTTTCCGTCTCCCATGTTATATGCTGGCCCCCACAGAGGTCCAGTGGCACTGCAGGTCCC
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                                       TGAATGCTGATGCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCACAATGGCCATGCCC
                                                                                                                                                                                               TGTTGATGCAGGACACCTGCCGCAGGCTCCTAGAGAGGGGGCTACAAGCACCCGGTCCTCC
                                                                                                                                                                                                                                                                                                    2150 TGCTTCATCCACTTGGAGGCTACAAAGCTGATGATGTCCCACTTGATTGGCGAATGA
                                                                                                                                                                                                                                                                                                                                                        AGCAGCACGCGCTGTGCTCGAGGGAAGGGGTCCTGGATCCCAAGTCAACCATTGTTGCCA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        963 -TGGACGGAGGGTAGCTATCTTACGAGACGCTGAATTCTATGAACACAGAAAAGAGGAAC 1021
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                                                                                                                                                                                                                                                                                                                                                                                                                              (SAMS) promoter fused to two soybean conversions and a second encoding cystathionine-gramma-synthase (CGSI) were inserted into binary vectors for Arabidopsis transformation. The SAMS promoter is active in seedlings and callus and over-expression of a gene in embryo stage can be achieved at an early developing stage using the SAMS promoter. The SAMS promoter may be used as an alternative to cauliflower mosaic virus 35s promoter to drive expression of selectable marker genes. Plant cells transformed with the SAMS constitutive promoter are useful for increasing or decreasing the expression of heterologous nucleic acid fragments in a plant, preferably corn, rice, wheat, barley, palm, Arabidopsis, soybean, oil seed Brassica, peanut, sunflower, safflower, cotton, tobacco, tomato, potato or cocoa. Target heterologous nucleic acid fragments include herbicide resistance or pathogen resistance nucleic acid fragments.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TCCACGAACTCTTTGTGCCGGAAAACAAACTTGACCACGTCCGAGCTGAGGCTGAAACTC 730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       790
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                                                                                                                                                                                                                                                                                                                                                                                                                  Expression cassettes comprising the S-adenosyl-L-methionine synthetase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TCTCTGCAGAGGATAAGACACGGCTGGAAGGGTGCAGCAAGTTTGTCCTGGCACATGG--
                                                                                                                                                                                                                                                                                          S-adenosyl-L-methionine synthetase promoter for expressing target heterologous herbicide-resistance or pathogen-resistance nucleic acid fragments in plants, especially soybean
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGGTTTTGAGCGAAGGCT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             851 ACACCCTGCTA----GATGATGCGTGATCAACATGAGCATCCCCATTGTACTGCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 3684;
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Best Local Similarity 59.9%; Pred. No. 4.1e-107;
Matches 698; Conservative 0; Mismatches 455;
                                                                                                                                                                                                                                                                                                                                                                      Example 7; Page 48-49; 50pp; English
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                                                                                                                                                                         (DUPO ) DU PONT DE NEMOURS &
                                                                                                                                    98US-0113045
                                                                                              99WO-US30180
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                WO200037662-A2
                                                                                              17-DEC-1999;
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AAH31145 standard; cDNA; 401

RESULT 13

AAH31145

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Sudduth-Klinger J;

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The present invention describes a library of polynucleotides comprising 1079 nucleotide sequences (given in AAH30067 to AAH31145). Also described are: (1) an isolated polynucleotide (1) having at least 90% identity to one of the 1079 sequences; (2) a recombinant host cell containing (1); cone of the 1079 sequences; (2) a recombinant host cell containing (1); cone of the 1079 sequences; (2) a vector comprising (1); and (6) a method of detecting binds to (11); (5) a vector comprising (1); and (6) a method of detecting differentially expressed genes correlated with a cancerous of detecting differentially expressed genes correlated with a cancerous state of a mammalian cell comprising detecting a gene product encoded by (5 of the 1079 sequences given in the specification. The polynucleotides are used to monitor patients having (or susceptible) to cancer to detect potentially malignant events at a molecular level before they are detectable at a gross morphological level. The polynucleotides are also useful for monitoring the efficacy of various therapies and preventive interventions. Polynucleotide probes based on the disclosed sequences are useful for chromosome mapping and detection of transcription levels. The 1079 polynucleotide sequences were derived from a human colon cancer ca
                                                                                                                                                                                                                                                    J, Innis MA, Garcia PD, Sudduth-Kling
Randazzo F, Kennedy GC, Pot D, Kassam
Crkvenjakov R, Dickson M, Drmanac S,
Garcia V, Jones LW, Stache-Crain B;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cy comprising 1079 defined sequences, to detect cancer or susceptibility to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 1; Page 463; 502pp; English
98US-0102180.
98US-0102380.
98US-0103815.
98US-0105877.
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Drmanac R,
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28-SEP-1998;
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Reinhard C,
Lamson G, D
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Sequence 401 BP; 82 A; 116 C; 118 G; 85 T; 0 other;

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DB 21; Length 401;
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Pred. No. 2.2e-106;
0; Mismatches 7;
20.5%;
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Query Match.
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1270 GACACCTGCCGCAGGCTCCTAGAGGGGGCTACAAGCACCCGGTCCTCCTACTACACCCCT 1329

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1210 GCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCACAATGGCCATGCCCTGTTGATGCAG 1269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The present invention describes a library of polynucleotides comprising are: (1) an isolated polynucleotide (1) having at least 90% identity to one of the 1079 sequences: (2) a recombinant host cell containing (1); (3) an isolated polypeptide (II) encoded by (I); (4) an antibody that specifically binds to (II); (5) a vector comprising (I); and (6) a method of detecting differentially expressed genes correlated with a cancerous state of a mammalian cell comprising detecting a gene product encoded by 65 of the 1079 sequences given in the specification. The polynucleotides are used to monitor patients having (or susceptible) to cancer to detect
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         potentially malignant events at a molecular level before they are detectable at a gross morphological level. The polynucleotides are also useful for monitoring the efficacy of various therapies and preventive interventions. Polynucleotide probes based on the disclosed sequences are useful for chromosome mapping and detection of transcription levels. The 1079 polynucleotide sequences were derived from a human colon cancer cell line Kml2L4+A cDNA library.
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detection; colon cancer cell line Km12L4-A; ss.
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                                                                                                               Human colon cancer cell line Km12L4-A cDNA library derived seg#1079.
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Randazzo F, Kennedy GC, Pot D, Kassam A;
Crkvenjakov R, Dickson M, Dimanac S, Lab
Garcia V, Jones LW, Stache-Crain B;
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Pred. No. 2.2e-106;
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Lamson G, Drmanac R,
Leshkowitz D, Kita D,
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301 GGTGCCAATTCTACATTGTGGGGA-GGACCCTGCAGGAATGCCCCATCCTGAAACCAAG 359
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                                Hybridisation assay, genetic mapping, gene expression control, protein identification; signal transduction pathway; metabolic pathway; promoter; termination sequence; ss.
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1083 1143 967 CGGAGGGTAGCTATCTTACGAGACGCTGAATTCTATGAACACAGAAAAGAGGAACGCTGT 1026 GGGCTGGACCAATACCGTCTGACACCTCTGGAGCTCAAACAGAAATGTAAAGAAATGAAT 1203 1263 CACCCTCTGGGCGGCTGGACCAAGGATGACGATGTGCCTCTAGACTGGCGGATGAAGCAG 1383 ATTGCGGGTGCCCAATTTCTACATTGTGGGGAGGGACCCTGCAGGAATGCCCCATCCTGAA 1563 1564 ACCAAGAAGGATCTGTATGAACCCACTCATGGGGGCAAGGTCTTGAGCATGGCCCCTGGC 1623 ATGCAGGACACCTGCCGCAGGCTCCTAGAGGGGGCTACAAGCACCCGGTCCTCCTACTA 1323 735 795 728 GCAGAGGATAAGACACGGCTGGAAGGGTGCAGCAAGTTTGTCCTGGCACAT---GGTGGA 549 AACCCCGTCTCTATCCTCAGCGATATTAGAGATTATAAGCATCCAAAGGAAGAAAGGATA 676 GAACTCTTTGTGCCGGAAAACAAACTTGACCACGTCCGAGCTGAGGCTGAAACTCTCCCT TCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCCAGGTTTTGAGCGAAGGCTGGGCC ACTCCCCTCAAAGGTTTCATGCGGGAGAAGGAGTACTTACAGGTTATGCACTTTGACACC CTGCTAGATGATG. ----GCGTGATCAACATGAGCATCCCCATTGTACTGCCCGTCTCT TCCCGTGTTTGGGGGACAACATGTACAAAACACCCCCATATCAAAATGGTGAT---GGAA 1084 AGTGGGGACTGGTTGGTGGAGACCTTCAGGTGCTGGAGAAATAAGATGGAATGAT GCTGATGCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCACAATGGCCCATGCCCTGTTG CCGTCTCCCATGTTATATGCTGGCCCCACAGAGGTCCAGTGGCACTGCAGGTCCCGGATG 12; Length 1687; Indels 19.6%; Score 360.8; DB 21; 58.6%; Pred. No. 1.9e-100; ive 0; Mismatches 472; 990S-0161359. 99US-0161360. 99US-0161361. 99US-0161920. 99US-0161992. 99US-0161993. Conservative Query Match Best Local Similarity Matches 686; Conserv 26-0CT-1999; 26-0CT-1999; 26-0CT-1999; 28-0CT-1999; 28-0CT-1999; 29-0CT-1999; 489 136 309 964 369 856 429 910 1027 1144 1204 1264 699 789 849 1324 1444 1029 1504 729 606 1384 696 1089 PR PR PR PR PR qq qq g ò õ ò qq ŏ ò a ò qq δ g ò g ŏ Dp δý g δ g à. a g g ζ ò ò g ò

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                                                                                                                                                                                                         Arabidopsis thaliana DNA fragment SEQ ID NO: 36133.
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000000000000000000	ALIGNMENTS 561 R. R. RELATED NUCL uticals, Inc ows Version 879,561	49 PF-0325 US N:
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; Patent No. 6338966
; GENERAL INFORMATION:
; APPLICANT: Allen, Steve
; APPLICANT: Railos, Steve
; APPLICANT: Railoski, Antoni
; TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
; FILE REFERENCE: BB-1167-A
; CURRENT APPLICATION NUMBER: US/09/346,408B
; CURRENT APPLICATION NUMBER: 60/092,833
; EARLIER APPLICATION NUMBER: 60/092,833
; EARLIER FILING DATE: July 14, 1998
; NUMBER OF SEQ ID NOS: 12
; SOFTWARE: Microsoft Office 97
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Pred. No. 5.5e-107;
O; Mismatches 473;
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APPLICANT: Falco, Carl
TITLE OF INVENTION: Genes Encoding Sulfate,
FILE REFERENCE: BB-1167-A
CURRENT APPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60,092,833
EARLIER FILING DATE: July 14, 1998
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SOFTWARE: Microsoft Office 97
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APPLICANT: Anderson, Shawn
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                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGGCCACTCCCCTCAAAGGTTTCATGCGGGAGAAGGAGTACTTACAGGTTATGCACTTTG
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                                                                                                                                           Length 1697;
                                                                                                                                                                                          Indels
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                                                                                                                                           Score 383; DB 4;
Pred. No. 9.8e-112;
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                                                                                                                                                                                          Conservative
                                                                                                                                                                 Best Local Similarity
Matches 698; Conser
                                            ; TYPE: DNA
; ORGANISM: Glycine
US-09-346-408-5
SEQ ID NO 5
LENGTH: 1697
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ORGANISM: Momordica charantia

; ORGANISM: ML US-09-346-408-3

FAGGA 1138           FTAGTATA 649	STAAAGAAA 1198 	GCCATGCCC 1258             GCATGCAC 769	CGGTCCTCC 1318	GGGGATGA 1378        TAGAATGG 889	rrgrrgcca 1438             CGFGTCTA 949	SCAGGTCCC 1498 	TGCCCCATC 1558	SCATGGCCC 1618	AAGCCAAAA 1678 	AGGAACTC 1738	CCCCAAAG 1798	<u>.</u>	·
-GGAAAGTGGGGACTGGGTGGTGGAGACCTTCAGGTGCTGGAGAAATAAGATGGA 	ATGATGGGCTGGACCAATACCGTCTGACACCTCTGGAGCTCAAACAGAAATGTAAAGAAA 	TGAATGCTGATGCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCACAATGGCCATGCCC	TGTTGATGCAGACACTGCCGCAGGCTCCTAGAGGGGCTACAAGCACCGGTCCTCC	TACTACACCCTCTGGGCGGCTGGACCAAGGATGACGATGTGCCTCTAGACTGGCGGATGA 	AGCAGCACGCGGCTGTGCTCGAAGGGGTCCTGGATCCCAAGTCAACCATTGTTGCCA 	TCTTTCCGTCTCCCATGTTATATGCTGGCCCCACAGAGGTCCAGGGGCACTGCAGGTCCC	GGATGATTGCGGGTGCCAATTTCTACATTGTGGGGAGGGA	CTGAAACCAAGAGGTCTGTATGAACCACTCATGGGGGCAAGGTCTTGAGCATGGCCC 	CTGGCCTCACCTCTGTGGAAATCATTCCATTCCGAGTGGCTGCCTACAACAAAGCCAAAA 	AAGCCATGGACTTCTATGATCCAGCAAGGCACAATGAGTTTGACTTCATCTCAGGAACTC	GAATGAGGAAGCTCGCCGGGAAGGAGAATCCCCCAGATGGCTTCATGGCCCCCAAAG 	CATGGAAGGTCCTGACAGATATACAGGTCCCTGGAGA 1837 	US-09-346-408-3  US-09-346-408-3  Sequence 3, Application US/09346408B  Patent No. 6338966  GENERAL INFORMATION:  APPLICANT: Allen, Steve  APPLICANT: Rafalski, Antoni  APPLICANT: Rafalski, Antoni  TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins  FILE REFERENCE: BB-1167-A  CURRENT APPLICATION NUMBER: US/09/346,408B  CURRENT FILING DATE: 1999-07-01  EARLIER APPLICATION NUMBER: 60/092,833  EARLIER APPLICATION NUMBER: 60/092,833  EARLIER APPLICATION NUMBER: 50/092,833  EARLIER FULL ARRIVED NUMBER: 50/092,833  EARLIER FULL ARRI
1080	1139	710	1259	1319	1379	1439	1499 (	1559 0	1619 (	1679 4	1739 (	1799 (	SULT 4 Sequence 3, Ap Sequence 3, Ap Petent No. 633 Seberal INFORM APPLICANT: An APPLICANT: Fa APPLI
Qy Dp	Oy Dp	Oy Dp	Oy Db	Qy Db	Qy Db	Qy	Qy Dp	Qy	Qy Dp	G G	Qy. Db	Oy Dp	RESULT Seque Seque Pate RAPP APP TITT TITT TITT COUR RAPP SEAR

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                                                                                            302 GAGGCCTTATCCTTGCCCAGAATCGAGCTCTCCAGCATCGATATCCAGTGGGTTCATGTG 361
                                                                                                                         778 TTGAGCGAAGGCTGGGCCACTCCCCTCAAAGGTTTCATGCGGGAGAAGGAGTACTTACAG 837
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                                                              718 GAGGCTGAAACTCTCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGGTT 777
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                                0; Mismatches 435; Indels
   Score 368; DB 4; I Pred. No. 7.2e-107;
Query Match
Best Local Similarity 60.0%;
Matches 671; Conservative
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PPLICATION NUMBER: 60/056,886 ILING DATE: 1997-08-22
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ILING DATE: 1997-08-22
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FILING DATE: 1997-08-22
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                                                             60/047,612
                                                                                                                           APPLICATION NUMBER: 60/047,632
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                                                                                                                                                                                                                                                                            FILING DATE: 1997-04-11
APPLICATION NUMBER: 60/043,568
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FILING DATE: 1997-04-11
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FILING DATE: 1997-04-11
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FILING DATE: 1997-04-11
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ILING DATE: 1997-08-22
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FILING DATE: 1997-08-22
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FILING DATE: 1997-08-22
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   60/047,596
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FILING DATE: 1997-04-11
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APPLICATION NUMBER: 60/043,311
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                                                                                                                                                                                  APPLICATION NUMBER: 60/047,601
FILING DATE: 1997-05-23
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                                                                                                                                                                                                                        1786 ATGGCCCCCAAAGCATGGAAGGTCCTGACAGATTATTA 1823
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FILING DATE: 1998-03-06
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FILING DATE: 1997-05-23
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180 TGCCCTGGAGGAGTACCTTGTCTCCCATGCCATCCCTTGTTACTCCCTGGATGGGGACAA 239
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                                                                            1200 GAATGCTGATGCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCACAATGGCCATGCCCT
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APPLICANT: Falco, Carl
APPLICANT: Falco, Carl
APPLICANT: Falco, Carl
APPLICANT: Rafalski, Antoni
TITLE OF INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
CUNRENT PAPLICATION NUMBER: US/09/346,408B
CURRENT FILING DATE: 1999-07-01
EARLIER APPLICATION NUMBER: 60/092,833
BARLIER FILING DATE: 12
SOFTWARE: Microsoft Office 97
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Pred. No. 7e-53;
0; Mismatches 162;
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Patent No. 6338966
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Best Local Similarity 65.6%;
Matches 320; Conservative
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ORGANISM: Zea mays
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llarity 92.2%; Pred. No. 1.4e-61;
Conservative 0; Mismatches 20; Indels
                                                                    FILING DATE: 1997-08-22
APPLICATION NUMBER: 60/056,892
FILING DATE: 1997-08-22
                                                                                                                                                                                                        APPLICATION NUMBER: 60/047,599
FILING DATE: 1997-05-23
                                                                                                                                                                                                                                             APPLICATION NUMBER: 60/047,588 FILING DATE: 1997-05-23
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FILING DATE: 1997-05-23
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APPLICATION NUMBER: 60/061,060
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                                                                                                                                                                    APPLICATION NUMBER: 60/047,595
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LING DATE: 1997-05-23
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APPLICATION NUMBER: 60/047,593
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LICATION NUMBER: 60/043,576
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APPLICATION NUMBER: 60/056,632
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FILING DATE: 1997-08-22
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APPLICATION NUMBER: 60/056,909
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FILING DATE: 1997-08-22
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APPLICATION NUMBER: 60/057,650
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Best Local Similarity
Matches 271; Conserv
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                                                                                                                                                                                                                                                                  424 CCATTCTTTGAAATATTTGTAGATGCACCTCTAAATATTTGTAAAGCAGAGACGTAAAA
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GENERAL INFORMATION:
GENERAL TAILOR. Steve
APPLICANT: Alderson. Shawn
APPLICANT: Falco, Carl
APPLICANT: Raflski, Antoni
TILEOR INVENTION: Genes Encoding Sulfate Assimilation Proteins
FILE REFERENCE: BB-1167-A
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   Mismatches
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EARLIER APPLICATION NUMBER: 66/092,833
EARLIER FILING DATE: July 14, 1998
NUMBER OF SEQ ID NOS: 12
SOFTWARE: Microsoft Office 97
SEQ ID NO 9
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   Conservative
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LOCATION:
FEATURE:
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                                                                                                                     1500 GATGATTGCGGGTGCCAATTTCTACATTGTGGGGAGGGACCCTGCAGGAATGCCCCATCC 1559
                                                                                                                                                                                          .560 TGAAACCAAGAAGGATCTGTATGAACCCACTCATGGGGGCAAGGTCTTGAGCATGGCCCC 1619
                                                   1440 CTTTCCGTCTCCCATGTTATATGCTGGCCCCACAGAGGTCCAGTGGCACTGCAGGTCCCG 1499
                                                                       421 AGAGA-----AAAGGACTCTATGATGCTGATCACGGAAAGAAGGT-TTGAGCTTGAGGCTCC 474
Score 169.2; DB 4; Length 1160; Pred. No. 1.1e-43;
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OPERATING SYSTEM: DOS
SOFTWARE: FastSEQ for Windows Version 2.0
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APPLICATION NUMBER: US/09/153,310
FILING DATE: 15-Sep-1998
CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hansen, Jorgen
Johannesen, Pia Francke
Pedersen, Mogens Bohl
Sorensen, Steen Bech
F INVENTION: Method of produc
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MOLECULE TYPE: Genomic DNA
SEQUENCE DESCRIPTION: SEQ ID NO: 41:
US-09-153-310-41
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APPLICATION NUMBER: <Unknown>
FILING DATE: <Unknown>
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NAME: Bent, Stephen A.
REGISTRATION UNMBER: 29,768
REFERENCE/DOCKET NUMBER: <U
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELECOMMUNICATION INFORMATION:
TELEPHONE: 202-672-5300
TELEFAX: 202-672-5399
                                                                                                                                                                                                                                                                                                                                                                                 Sequence 41, Application US/09153310 Patent No. 6326184 GENERAL INFORMATION:
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MEDIUM TYPE: Diskette
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Best Local Similarity
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                        134 TGTGGCTAACAGGTCTCTGGTGCTGGAAAAACAACGATAAGTTTTGCCCTGGAGGAGT 193
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                                                                                                                                                    TTAACAGAAATCTCGGATTCTCTCTGGGGACAGAGGAAAATATCCGCCGGATTGCTG 313
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                                                       104 TATGGTTTACAGGGCTATCTGGGTCAGGGAAATCAACGGTCTCTGTTGCCTTAGAAAAG
                                                                                      ACCTTGTCTCCCATGCCATCCCTTGTTACTCCCTGGATGGGGACAATGTCCGTCATGGCC
                                                                                                             314 AGGIGGCTAAGCTGTTTGCTGATGCTGGTCTGGTCTGCATTACCAGCTTTATTCTCCAT
                                                                                                                                                                                                                                                                            374 TCGCAAAGGATCGTGAGAATGCCCGCAAAATACATGAATCAGCAGGCGTGCCATTCTTTG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: FLEISCHMAN, Robert D.
APPLICANT: WHITE, Owen R.
APPLICANT: WHITE, Owen R.
APPLICANT: WHITE, Owen R.
TITLE OF INVENTION: DNA SEQUENCES FOR STRAIN ANALYSIS IN MYCOBACTERIUM TITLE OF INVENTION: TUBERCULOSIS
FILE REPERENCE: 24366-22007.00
CURRENT APPLICATION NUMBER: US/09/103,840A
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 110; DB 4; Length 4411529;
Pred. No. 1.5e-22;
); Mismatches 250; Indels 0;
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CTHER INFORMATION: H37Rv
US-09-103-840A-1
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Patent No. 6294328
GENERAL INFORMATION:
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al Similarity 51.0%;
260; Conservative (
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SEQ ID NO 1
LENGTH: 4411529
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Best Local Similarity
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US-09-103-840A-1
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CURRENT APPLICATION NUMBER: US/09/134,001C
CURRENT FILING DATE: 1998-088-13
PRIOR PELING DATE: 1997-11-08
PRIOR PELING DATE: 1997-11-08
PRIOR FILING DATE: 1997-11-08
PRIOR FILING DATE: 1997-11-08
PRIOR FILING DATE: 1997-11-08
SEQ ID NOS: 5674
SEQ ID NOS: 5674
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Pred. No. 1.6e-35;
0; Mismatches 111; Indels
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US-09-134-001C-1680
                                                                                                                                                                                                                                                                                                 7.8%;
                                                                                                                                                                                                                                                                                             Query Match 7.89
Best Local Similarity 66.39
Matches 220; Conservative
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Best Local Similarity
Matches 274; Conserva
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(517)
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US-09-346-408-9
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LOCATION:
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LOCATION:
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NAME/KEY:
                COCATION:
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                                                                                                                                                           1439962 GTGCCCTGGCTCGTAAAGTGCACGCTGATGCGGGAATCGACTTTTTCGAGGTGTTCTGTG 1440021
                                                                                                                                                                                                                                     1440022 ACACCCCGCTGCAGGACTGTGAGAGGCGTGATCCCAAAGGGTTGTACGCCAAAGCGCGTG 1440081
                                                                                                                                                                                                                                                                              CTGGGGAGATTAAAAGGATTTACAGGTATTGATTCTGATTATGAGAAACCTGGAAACTCCTG
                                             TGTTTGCTGATGCTGGTCTGCATTACCAGCTTTATTTCTCCATTCGCAAAGGATC
                                                                                                                                                                                                ATGCACCTCTAAATATTTGTGAAAGCAGAGACGTAAAAAGGCCTCTATAAAAGGGCCAGAG
                                                                                                                      GTGAGAATGCCCGCAAAATACATGAATCAGCAGGGCTGCCATTCTTTGAAATATTTGTAG
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                                                                                                                                                                                                                                                                                                                                                                                     Sequence 14, Application US/08232463
Patent No. 5670367
GENERAL INFORMATION:
APPLICANT: SCHEIFLINGER, F.
APPLICANT: SCHEIFLINGER, F.
APPLICANT: FALKNER, F. G.
TITLE OF INVENTION: RECOMBINANT FOWLPOX VIRUS
NUMBER OF SEQUENCES: 52
                                                                                                                                                                                                                                                                                                                                                          566 AGCGTGTGCTTAAAACCAATTTGTCCACAG 595
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 46.6;
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APPLICATION NUMBER: US/07/935,313
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COMPUTER: IBM PC COMPALIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/232,463
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1800 Diagonal Road,
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INFORMATION FOR SEQ ID NO: 14:
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APPLICATION. NUMBER: EP 91
FILING DATE: 26-AUG-1991
ATTORNEY/AGENT INFORMATION:
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MEDIUM TYPE: Floppy
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    ATGCCATCCCTTGTTACTCCCTGGATGGGGACAATGTCCGTCATGGCCTTAACAGAAATC 265
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OTHER INFORMATION: "n" bases at various positions throughout the sequence
COTHER INFORMATION: represent a, t, c or g
GS-09-103-840A-2
                                1440313 AGGCATCTCCGCTTACGTTCTGGACGGCGACAACCTACGGCATGGCCTCAACGCCGACC
                                                                           TCGGATTCTCTCCTGGGGACAGAGAGGAAAATATCCGCCGGATTGCTGAGGTGGCTAAGC
                                                                                                                                                         TGTTTGCTGATGCTGGTCTGCATTACCAGCTTTATTTCTCCATTCGCAAAGGATC
                                                                                                                                                                                                                                   GTGAGAATGCCCGCAAAATACATGAATCAGCAGGGCTGCCATTCTTTGAAATATTTGTAG
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APPLICANT: FRASER, Claire M.
APPLICANT: FRASER, Claire M.
APPLICANT: PRASER, Claire M.
TITLE OF INVENTION: DNA SEQUENCES FOR STRAIN ANALYSIS IN MYCOBACTERIUM
TITLE OF INVENTION: TUBERCULOSIS
TITLE OF INVENTION: TUBERCULOSIS
CURRENT APPLICATION NUMBER: US/09/103,840A
CURRENT FILING DATE: 1998-06-24
NUMBER OF SEQ ID NOS: 2
SOFTWARE: Patentin Ver. 2.1
SEQ ID NO 2
LENGTH: 4403765
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50.8%; Pred. No. 4.9e-22;
iive 0; Mismatches 251
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Patent No. 6294328
GENERAL INFORMATION:
APPLICANT: FLEISCHMAN, Robert D.
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nes 259; Conservative
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1120 CTGGAGAAAATAAGATGATGATGGCCTGGACCAATACCGTCTGACACCTCTGGAGCTC 1179
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                                                                                        140 SRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNR 199
             80 SRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNRSRNRNR 139
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Fatent No. 6281344
GENERAL INFORMATION:
APPLICANT: SZOSCIAK, Jack W.
APPLICANT: SZOSCIAK, JACK W.
APPLICANT: SZOSCIAK, SELECTION OF PROTEINS USING RNA-PROTEIN
TITLE OF INVENTION: EUSIONS
FILE REFERENCE: 00786/35007
CURRENT APPLICATION NUMBER: 05/09/244,796
CURRENT FILING DATE: 1999-02-05
EARLIER PILING DATE: 1999-01-27
EARLIER PILING DATE: 1997-01-27
EARLIER FILING DATE: 1998-01-27
EARLIER FILING DATE: 1998-01-27
EARLIER FILING DATE: 1998-01-27
EARLIER FILING DATE: 1998-01-37
EARLIER FILING DATE: 1998-01-37
SOFTWARE: 1998-01-14
NUMBER OF SEQ ID NOS: 33
SOFTWARE: FASSEQ for Windows Version 4.0
LENGTH: 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 289;
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10.3%; Pred. No. 0.53;
Live 95; Mismatches 141;
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; OTHER INFORMATION: n = A,T,C or G
US-09-244-796-17
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ORGANISM: Artificial Sequence
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Best Local Similarity 10.3%
Matches 27; Conservative
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                                                                                                                                                                                           GGCTGGTTGGTGGAGACCTTCAGGTGCTGGAGAAATAAGATGGAATGATGGCCTGGACC 1153
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                                                                                                                                                                                                                                                914 AGGATAAGACACGGCTGGAAGGGTGCAGCAAGTTTGTCCTGGCACATGGTGGACGGAGGG
                                                                     794 CCACTCCCTCAAAGGTTTCATGCGGGAGAAGGAGTACTTACAGGTTATGCACTTTGACA
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APPLICANT: SZOSTAK, Jack W.
APPLICANT: ROBERTS, Richard W.
APPLICANT: ROBERTS, Richard W.
APPLICANT: ROBERTS, RICHARD W.
APPLICANT: ROBERTS, RICHARD W.
APPLICANT: LAW, RIME
TITLE OF INVENTION: SELECTION OF PROTEINS USING RNA-PROTEIN
TITLE OF INVENTION: FUSIONS
FILE REFERENCE: 00786/35003
CURRENT APPLICATION NUMBER: 05/035,963
EARLIER APPLICATION NUMBER: 60/035,963
EARLIER PILING DATE: 1997-01-27
EARLIER PILING DATE: 1997-01-27
EARLIER PILING DATE: 1997-11-06
NUMBER OF SEQ ID NOS 33
SOFTWARE: FESTSEQ FOR WINDOWS Version 4.0
                              Indels
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5.4%; Pred. No. 0.00044; ative 214; Mismatches 173;
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Patent No. 6258558
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LOCATION: (1)...(289)
CTHER INFORMATION: n = A,T,C or G
US-09-007-005-17
Best Local Similarity 5.4%; Pred
Matches 22; Conservative 214;
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US-09-007-005-17
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| Sequence 19, Application US/09162484
| Sequence 19, Application US/09162484
| Sequence 19, Application US/09162484
| Patent No. 6248724
| GENERAL INCOMENTION:
| APPLICANT: PAILILES W. Ian
| TITLE OF INVENTION: ANGIOTENSIN CONVERTING ENZYME MRNA AND METHODS OF USE
| FILE REPERENCE: UPLA-008/70F1A087; US/09/162,484
| CURRENT FILILEM DATE: 1998-09-25
| EARLIER FILILEM DATE: 1997-09-25
| EARLIER PRILICANTON NUMBER: 1997-09-25
| EARLIER PRILICANTON NUMBER: 1997-09-25
| EARLIER PRILICANTON NUMBER: 1997-09-25
| SOOTHWARE: Patentin Ver. 2.0
| SEQ ID NOS: 19
| SEQ ID NOS: 19
| SEQ ID NOS: 19
| OWERY MATCH
| 1984; SCOTE 34.2; DB 4; Length 3942;
| FEATH: 3942
| TREATH: 39
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Sequence 81, Appl
Sequence 62, Appl
Sequence 1680, Appl
Sequence 160, Appl
Sequence 2167, Appl
Sequence 255, Appl
Sequence 1752, Appl
Sequence 1754, Appl
Sequence 574, Appl
Sequence 574, Appl
Sequence 574, Appl
              Sequence 2074, Ap
Sequence 1736, Ap
Sequence 377, App
Sequence 710, App
Sequence 264, App
Sequence 6045, App
Sequence 11, Appliance 5045, App
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GCCCTGGAGGAGTACCTTGTCTCCCATGCCATCCCTTGTTACTCCCTGGATGGGGACAAT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; NAME/KEY: misc_feature
; OTHER INFORMATION: Incyte ID No. US20020156263A1 1420940CB1
US-09-974-298-183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 183, Application US/09974298
Patent No. US20020156263A1
GENERAL INFORMATION:
TITLE OF INVENTION: GENES EXPRESSED IN BREAST CANCER
FILE REFERENCE: PA-0037 P
CURRENT APPLICATION NUMBER: US/09/974,298
CURRENT APPLICATION NUMBER: 60/238,331
PRIOR APPLICATION NUMBER: 60/238,331
PRIOR APPLICATION NUMBER: 60/238,331
PRIOR APPLICATION NUMBER: 5000-05-10
NUMBER OF SEQ ID NOS: 194
SEQ ID NO 183
LENGTH: 2617
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           US-09-974-300-2074

US-09-974-300-2074

US-09-938-842A-710

US-09-938-842A-710

US-09-93-876-6045

US-09-92-876-6045

US-09-92-876-6045

US-09-741-669-81

US-09-771-161A-62

US-09-960-352-3618

US-09-960-352-3618

US-09-771-161A-62

US-09-960-352-3618

US-09-771-161A-62

US-09-771-161A-62

US-09-771-161A-62
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US-09-736-457-1752
US-09-902-941-1752
US-09-849-626-1752
US-10-017-754-1752
US-10-123-155-10
US-10-123-155-234
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US-09-878-574-2555
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US-10-184-634-574
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Pred. No. 0;
0; Mismatches
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99.0%;
Query Match
Best Local Similarity 99.0 Matches 1841; Conservative
                                                                     640681
347
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368
1049
311
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ORGANISM: Homo sapiens
8.6
7.5
6.9
6.9
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5.1
5.0
4.6
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                                                                            127
94.2
93.4
92.4
85.4
82.2
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Sequence 116, Appl
Sequence 116, Appl
Sequence 2084, Appl
Sequence 2084, Appl
Sequence 8898, Appl
Sequence 12859, Appl
Sequence 12859, Appl
Sequence 24, Appl
Sequence 24, Appl
Sequence 24, Appl
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23146, A
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Sequence 86, Appl
Sequence 116, App
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8934.763 Million cell updates/sec
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Sequence 2314
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/cgn2_6/ptodata/2/pubpna/PCOT_NEW_PUB.seq:*
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/cgn2_6/ptodata/2/pubpna/USO6_PUBCOMB.seq:*
/cgn2_6/ptodata/2/pubpna/USO6_PUBCOMB.seq:*
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/cgn2_6/ptodata/2/pubpna/USO9_PUBCOMB.seq:*
                                                                                                      June 4, 2003, 16:43:32; Search time 289 Seconds
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/cgn2_6/ptodata/2/pubpna/US60_PUBCOMB.seq:*
             GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
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US-09-864-761-6431
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PRIOR APPLICATION NUMBER: US 60/048,186
PRIOR FILING DATE: 1997-05-30
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PRIOR PELING DATE: 1997-05-30
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18 FILING DATE: 1997-05-30

28 APPLICATION NUMBER: US 60/048,131

OR FILING DATE: 1997-05-30

OR APPLICATION NUMBER: US 60/048,096

OR APPLICATION NUMBER: 1997-05-30
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APPLICATION DATE: 1997-02 C. APPLICATION NUMBER: US 60
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71.3%;
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; ORGANISM: Homo sapiens
US-09-984-245-86
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Best Local Similarity
Matches 1305; Conserv
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                     PRIOR FILING DATE: 1997-08-05
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PRIOR FILING DATE: 1997-10-02
NUMBER OF SEQ ID NOS: 343
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 116
LENGTH: 2527
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larity 71.3%;
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Matches 1305; Conserv
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; ORGANISM: HOMO
US-09-984-245-116
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TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: PZ004Pl
                                                                                                                                                                                                                                           1809 CCTGACAGATTATTACAGGTCCCTGGAGAA 1838
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CURRENT PELLING DATE: 12001-10-29
PRIOR PAPLICATION NUMBER: US/09/984,245
CURRENT PELLING DATE: 1998-09-17
PRIOR FILING DATE: 1998-09-17
PRIOR FILING DATE: 1998-09-17
PRIOR FILING DATE: 1997-03-21
PRIOR PELLORATION NUMBER: US 60/041,277
PRIOR PELLORATION NUMBER: US 60/041,276
PRIOR FILING DATE: 1997-03-21
PRIOR PELLING DATE: 1997-03-30
PRIOR PELLING DATE: 1997-03-30
PRIOR PELLORATION NUMBER: US 60/048,188
PRIOR PELLORATION NUMBER: US 60/048,189
PRIOR PELLORATION NUMBER: US 60/048,189
PRIOR PELLORATION NUMBER: US 60/048,187
PRIOR APPLICATION NUMBER: US 60/048,187
PRIOR PELLORATION NUMBER: US 60/048,187
PRIOR APPLICATION NUMBER: US 60/048,352
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Patent No. US20020165374A1
GENERAL INFORMATION:
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US20030050461A1

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APPLICANT: Young et al.
TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: P2004P1
CURRENT APPLICATION NUMBER: US/09/966,262
CURRENT FILING DATE: 2001-10-01
                                                                                                                       PRIOR PELICATION NUMBER: US 09/154,707
PRIOR APPLICATION NUMBER: US 09/154,707
PRIOR APPLICATION NUMBER: US 00/041,277
PRIOR APPLICATION NUMBER: US 60/042,344
PRIOR FILING DATE: 1998-03-19
PRIOR FILING DATE: 1997-03-21
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TGACACCCTGCTAGATGATGGCGTGATCAACATGAGCATCCCCCATTGTACTGCCCGTCTC 908
                                                                                                                  994 TCATGAAGATAAAAGAGGGTGGACGGCTGTACAGCATTTGCTCTGATGTATGAGGCCCG
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GATCAAGAAGCAAAAGACGGAGAACCAGCAGAAATCCACCAATGTAGTCTATCAGGCCCA Gaps ö Length 2527; 525; Indels DB 9; Score 990; DB Pred. No. 0; 0; Mismatches Ouery Match 53.7%; Best Local Similarity 71.3%; Matches 1305; Conservative Patentin Ver. 2.0 SEQ ID NOS: 343 ; ORGANISM: Homo sapiens US-09-966-262-86 SEQ ID NO 86 TYPE: DNA

RESULT 4 US-09-966-262-86 ; Sequence 86, Application US/09966262

94 GAGCAA 69 CCATGT 1111	GAGCAATAACGCGCAGAACTGGGGAATGCAGAGCAACCAATGTCACCTACCAAGCCCA 153 CCATGTGAGAGGAATAAGAGGGCAAGTGGTTGGAACAAGGGGTGGTTCCGAGGATG 128	Qy 1149 GGACCAAFACCGTCTGACACCTCTGGAGCTCAAACAGAAATGTAAAGAAATGAATG
129 TACCGTGTGGCTAACAGGTC 	118	Qy 1209 TGCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCACAATGGCCATGCCCTGTTGATGCA 1268
189 GGAGTACCTTGTCTCCCATC   189 GGAGTACCTTGTCTCCCATC		QY 1269 GGACACCTGCCGCAGGCTCCTAGAGAGGGCTACAAGCACCCGGTCCTCCTACTACACCC 1328
249 TGGCCTTAACAGAAATCTCG	249 TGGCCTTAACAGAAATCTCGGATTCTCCTGGGGACCAGAGGGAAAATATCCGCGGGAT 308	Oy 1329 TCTGGGGGGCTGGACCAAGGATGACGATGTGCCTCTAGACTGGGGGATGAAGCAGCACGC 1388
309 TGCTGAGGTGGCTAAGCTGT 	309 TGCTGAGGTGGCTAAGCTGTTTGCTGATGCTGGTCTGCATTACCAGCTTTATTTC 368 	OY 1389 GGCTGTGCTGGAGGAGGGGTCCTGGATCCAAGTCATTGTTGCCATCTTTCGTC 1448
369 TCCATTCGCAAAGGATCGT 	369 TCCATTCGCAAAGGATCGTGAGAATGCCCGCAAAATACATGAATCAGCAGGCTGCCATT 428 	Qy 1449 TCCCATGTTATATGCTGGCCCCACAGAGGTCCAGTGGCACGGGTCCGGGATGATTGC 1508
429 CTTTGAAATATTTGTAGAY 	429 CTTTGAAATATTTGTAGATGCACCTCTAAATATTTGTGAAAGCAGAGGCGTAAAAGGCCT 488 	OY 1509 GGGTGCCAATTTCTACATTGTGGGGGGGCGCCCCGCGGAGGAATGCCCCATCGTGAAACCAA 1568
489 CTATAAAAGGGCCAGAGC	489 CTATAAAAGGCCAGAGCTGGGGAGTTAAAGGATTTACAGGTATTGATTCTGATTATGA 548 	OY 1569 GAAGGATCTGTATGAACCCACTCATGGGGGCAAGGTCTTGAGCATGGCCCTGGCCTCAC 1628
549 GAAACCTGAAACTCCTGA 	GTGT       GTGT	QY 1629 CTCTGTGGAAATCATTCCGAGTGGCTGCCTACAAAGCCAAAAAGCCATGGA 1688
609 CCACCAGGTAGTGGAACT 	AAGA      ATGA	OY 1689 CTTCTATGATCCAGCACAATGAGTTTGACTTCATCAGGAACTCGAATGAGGAA 1748
669 TATCCACGAACTCTTTGT 	TATCCACGAACTCTTTGTGCCGGAAAACTTGACCACGTCCGAGCTGAGGCTGAAAC 728 	
729 TCTCCCTTCATTATCAATT	729 TCTCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGGTTTTGAGCGAAGG 788   1	Qy 1809 CCTGACAGATTATTACAGGTCCCTGGAGAA 1838 
789 CTGGGCCACTCCCCTCAA                         874 TTGGCAACCCCATTGAA	789 CTGGGCCACTCCCTCAAAGGTTTCATGCGGGAGAAGGAGTACTTACAGGTTATGCACTT 848 	RESULT 5 US-09-966-262-116 ; Sequence 116, Application US/09966262
849 TGACACCCTGCTAGATGA 	849 TGACACCCTGCTAGATGAGGGGTGATCAACATGAGCATCCCCATTGTACTGCCGTCTC 908 	; Publication No. U\$2003050461A1 ; GENERAL INFORMATION: ; APPLICANT: Young et al. ; TITLE OF INVENTION: 87 Human Secreted Proteins .
909 TGCAGAGGATAAGACACGC 	TGCAGAGGATAAGACACGGCTGGAAGGGTGCAAGTTTGTCCTGGCACATGGTGGACG 968 	; FILE REFERENCE: P2004P1 ; CURRENT APPLICATION NUMBER: US/09/966,262 ; CURRENT FILING DATE: 2001-10-01 ; PRIOR APPLICATION NUMBER: US 09/154,707
969 GAGGGTAGCTATCTTACGF   11   1   1   1   1   1   1   1   1	GAGGGTAGCTATCGAGACGCTGAATTCTATGAACACAGAAAAGAGGAACGCTGTTC 1028 	; PRIOR FILING DATE: 1998-09-17 ; PRIOR APPLICATION UNMBER: PCT/US98/05311 ; PRIOR FILING DATE: 1998-03-19 ; PRIOR APPLICATION NUMBER: US 60/041,277
1029 CCGTGTTTGGGGGACAACA	CCGTGTTTGGGGGACAACATGTACAAAACACCCCATATCAAAATGGTGATGGAAGTGG 1088 	; PRIOR FILING DATE: 1997-03-21 ; PRIOR APPLICATION NUMBER: US 60/042,344 ; PRIOR FILING DATE: 1997-03-21 ; PRIOR APPLICATION NUMBER: US 60/041,276
1089 GGACTGGCTGGTTGGTGG 		; PRIOR FILING DATE: 1997-03-21 ; PRIOR APPLICATION NUMBER: US 60/041,281 ; PRIOR FILING DATE: 1997-03-21 ; PRIOR APPLICATION NUMBER: US 60/048,094

FILING DATE:	Db	394 CGCAGAAGTTGCTAAACTGTTTGCAGATGCTGGCTTAGTGTGCATCACAAGTTTCATATC 453
PRIOR FILING DATE: 1997-05-30 PRIOR APPLICATION NUMBER: US 60/048,188	Qy	369 TCCATTCGCAAAGGATCGTGAGAATGCCCGCAAAATACATGAATCAGCAGGGCTGCCATT 428
	QQ	454 ACCTTACACTCAGGATGCCAACAATGCAAGGCAAATTCATGAAGGTGCAAGTTTACCGTT 513
PRIOR FILING DATE: 1997-05-30 PRIOR APPLICATION NUMBER: US 60/050,937 PRIOR FILING DATE: 1997-05-30	Oy da	CTTGAAATATTGTAGATGCACCTCTAAATATTTGTGAAAGCAGAGAGAG
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	G G	409 CLINARANAGOCCARGOCIGOGORANITIARAGOTITIARAGOTITICIARATOTICARTATOTARIA 348
FILING DATE: 1997-0: APPLICATION NUMBER:	Qy	549 GAAACCTGAAACTCCTGAGCGTGTGCTTAAAACCAATTTGTCCACAGTGAGTG
	Dp	634 AAAGCCAGAGGCCCCTGAGTTGGTGCTGAAAACAGACTCCTGTGATGTAAATGACTGTGT 693
PRIOR FILING DATE: 1997-05-30 PRIOR APPLICATION NUMBER: US 60/048,095 PRIOR APPLICATION TO THE TOTAL TOTAL TO THE TOTAL TOTAL TO THE TOTAL TOTAL TOTAL TO THE TOTAL TOTAL TOTAL TO THE TOTAL TOT	oy Bb	609 CCACCAGGTAGTGGAACTTCTGCAAGAGCAGAACATTGTACCCTATACTATAATCAAAGA 668 
FILING DATE: 1997-05 FILING DATE: 1997-05 FILING DATE: 1997-05	Qy Db	669 TATCCACGAACTCTTTGTGCCGGAAAACAAACTTGACCACGTCCGAGCTGAGGCTGAAAC 728 
APPLICATION NUMBER: FILING DATE: 1997-05 APPLICATION NUMBER: FILING DATE: 1997-05	Qy	729 TCTCCCTTCATTATCAAAGCTGGATCTCCAGTGGGTCCAGGTTTGAGCGAAGG 788
08 5-3( 08 5-3(	Qy Db	789 CTGGGCCACTCCCTCAAAGGTTTCATCGGGAGAAGGAGTACTTACAGGTTATGCACTT 848 1111   1   1   1   1   1   1   1   1
APPLICATION NUMBER: US FILING DATE: 1997-08-05 APPLICATION NUMBER: US FILING DATE: 1997-08-19	Qy	
FRIDK FILING DATE: 1997-10-02 NUMBER OF SEQ ID NOS: 343 SOFWWARE: Patentin Ver. 2.0	Qy	909 TGCAGAGGATAAGACACGGCTGGAAGGGTGCAGGTTTGTCCTGGCACATGGTGGACG 968
EQ 1D NO 110 LENGTH: 2527 TYPE: DNA ORGANISM: Homo sapiens	Qy	969 GAGGGTAGCTATACGAGACGTGAATTCTATGAACACAGAAAAGGGAACGCTGTTC 1028 -
53.7%; Score 990; DB 9; Length 2527; larity 71.3%; Pred. No. 0;	Qy	1029 CCGTGTTTGGGGGACAACATGTACAAAACACCCCCATATCAAAATGGTGATGGAAAGTGG 1088
SCAAAAGACGAGAACCAGCAGAAATCCACCA 	Qy Db	1089 GGACTGGCTGGTGGAGACCTTCAGGTGCTGGAGAAAATAAGATGGAATGATGGGCT 1148 
	Qy	1149 GGACCAATACCGTCTGGACTCTGGAGCTCAAACAGAAATGTAAAGAAATGAATG
	Qy	1209 TGCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCAATGGCCATGCCCTGTTGATGCA 1268 11
CCGTCA	oy Oy	1269 GGACACCTGCCGCAGGCTCCTAGAGGGGCTACAACACCGGTCCTCCTACTACACCCC 1328 
TGGCCTTAACAGAAATCTCGGATTCTCCTGGGGACAGAGAAAAAAATATCGGCGGAT	QY	1329 TCTGGGCGGCTGGACCAAGGATGACGATGTGCCTCTAGACTGCGGATGAAGCAGCAGC 1388 
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Pred. No. 0;
0; Mismatches 525;
PRIOR FILING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,131
PRIOR FILING DATE: 1997-05-30
PRIOR PRIOR PAPLICATION NUMBER: US 60/048,160
PRIOR PRIOR DATE: 1997-05-30
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PRIOR PILING DATE: 1997-05-30
PRIOR APPLICATION NUMBER: US 60/048,154
PRIOR APPLICATION NUMBER: US 60/056,370
PRIOR PILING DATE: 1997-08-05
PRIOR PILING DATE: 1997-08-05
PRIOR PILING DATE: 1997-08-19
PRIOR PILING DATE: 1997-08-19
PRIOR PILING DATE: 1997-08-19
PRIOR PILING DATE: 1997-08-15
PRIOR APPLICATION NUMBER: US 60/056,370
PRIOR PILING DATE: 1997-08-19
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TITLE OF INVENTION: 87 Human Secreted Proteins
FILE REFERENCE: PZ004P1
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CURRENT FILING DATE: 2001-10-29
PRIOR PAPLICATION NUMBER: 09/154,707
PRIOR PELLING DATE: 1908-09-17
PRIOR PILING DATE: 1998-09-17
PRIOR PLILOR DATE: 1998-09-19
PRIOR PLILOR DATE: 1997-03-19
PRIOR PLILOR DATE: 1997-03-21
PRIOR PLILOR DATE: 1997-05-30
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Publication No. US20030069406Al
GENERAL INFORMATION:
APPLICANT: Young et al.
TITLE OF INVENTION: 87 Human Secreted Prot
FILE REPERENCE: PS004P1
CURRENT APPLICATION NUMBER: US/10/143,090
CURRENT FILING DATE: 2002-05-13
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SOFTWARE: Pater
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; Sequence 116, Application US/10143090
; Publication No. US20030069406A1
; GENERAL INFORMATION:
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PRIOR APPLICATION NUMBER: 09/15
PRIOR FILING DATE: 1998-09-17
NUMBER OF SEQ ID NOS: 343
SOFTWARE: Patentin Ver. 2.0
LENGTH: 2527
                                                                                                 53.7%;
71.3%;
                                                                                               Query Match
Best Local Similarity 71.3
Matches 1305; Conservative
                                                          TYPE: DNA
GORGANISM: Homo sapiens
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FILE REFERENCE: P2004P1
CURRENT APPLICATION NUMBER: US/10/143,090
CURRENT FILING DATE: 2002-05-13
PRIOR APPLICATION NUMBER: 09/154,707
PRIOR FILING DATE: 1998-09-17
NUMBER OF SEQ ID NOS: 343
SEQ ID NO 116
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llarity 71.3%;
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US-10-143-090-116
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                                        1204 ATGGCTTTCTTTGATCCCTCAAGGGCTCAGACTTCTTGTTCATTTCTGGCACTAAGATG
                                                                                                                                 CCGTCTCCCATGTTATATGCTGGCCCCACAGAGGTCCAGTGGCACTGCAGGTCCCGGATG
                                                                                                                                                                                                                                                                                                               1564 ACCAAGAAGGATCTGTATGAACCCACTCATGGGGGCAAGGTCTTGAGCATGGCCCTGGC
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Pred. No. 2.9e-96;
0; Mismatches 148; Indels
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APPLICANT: Horne, Darci T.
APPLICANT: Wockley, Joseph G.
APPLICANT: Scherf, Uwe
APPLICANT: Gene Logic, Inc.
TITLE OF INVENTION: Gene Expression Profiles in Liv
FILE REFERENCE: 44921-5028-W0
CURRENT APPLICATION NUMBER: US 60/211,379
PRIOR PILING DATE: 2000-06-14
PRIOR APPLICATION NUMBER: US 60/237,054
PRIOR FILING DATE: 2000-10-02
NUMBER OF SEQ ID NOS: 3950
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Patent No. US20020142981A1
GENERAL INFORMATION:
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al Similarity 73.9%;
424; Conservative
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LOCATION: (1)..(574)

OTHER INFORMATION: n

US-09-880-107-360
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Best Local Similarity
Matches 424; Conserv
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LENGTH: 574
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                                                                                                         PLANTS CONTAINING
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                                                                                                         PLANTS, TRANSGENIC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 9;
                                                   APPLICANT: MILES, SOCIAL APPLICANT: MILES, SOCIAL APPLICANT: Wang, Xun APPLICANT: Zhu, Tong TITLE OF INVENTION: SAME, AND METHODS OF USE TITLE OF INVENTION: SAME, AND METHODS OF USE FILE REFERENCE: SCRIP1300-3 SCRIP1300-3 CURRENT APPLICATION NUMBER: US 60/227,866 PRIOR PRIOR PILING DATE: 2000-08-24 PRIOR PAPLICATION NUMBER: US 60/227,866 PRIOR PELING DATE: 2001-08-24 PRIOR PELING DATE: 2001-01-16 PRIOR APPLICATION NUMBER: US 60/300,111 PRIOR APPLICATION NUMBER: US 60/300,111 PRIOR PILING DATE: 2001-01-16 PRIOR PILING DATE: 2001-01-16 SPUNDER FILE SOCIAL SO
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APPLICANT: Algate, Paul A.
APPLICANT: Mannion, Jane
APPLICANT: Retter, Marc
APPLICANT: Corixa Corporation
TITLE OF INVENTION: Compositions and Methods for the Detection, Diagnosis and Ther
TITLE OF INVENTION: Hematological Malignancies
                                                                                                                                                                                                                                                                                                                                                                         1436 CCATCTTTCCGTCTCCCATGTTATATGCTGGCCCCACAGAGGTCCAGTGGCACTGCAGGT 1495
                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAAAAGCCATGGACTTCTATGATCCAGCAAGGCACAATGAGTTTGACTTCATCTCAGGAA 1735
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Pred. No. 1.1e-71;
0; Mismatches 100; Indels
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NUMBER OF SEQ ID NOS: 9597
SOFTWARE: FastSEQ for Windows Version 3.0
SEQ ID NO 8898
LENGTH: 600
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CURRENT APPLICATION NUMBER: US./10/040,862
CURRENT FILING DATE: 2001-11-06
PRIOR APPLICATION NUMBER: US./186,126
PRIOR PILING DATE: 2000-03-01
PRIOR APPLICATION NUMBER: US 60/190,479
PRIOR FILING DATE: 2000-03-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: US 60/200,545
FILING DATE: 2000-04-27
APPLICATION NUMBER: US 60/200,303
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APPLICATION NUMBER: US 60/200,779
FILING DATE: 2000-04-28
APPLICATION NUMBER: US 60/200,999
FILING DATE: 2000-05-01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; Sequence 8898, Application US/10040862
; Publication No. US20030078396A1
; GENERAL INFORMATION:
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                                                                                                                                                                                                       ; LOCATION: (572)
; OTHER INFORMATION: n=A,T,C or
US-09-796-692-8898
                                                                                                                                                                                                                                                                                           13.2%;
75.2%;
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Matches 303; Conservative
                                                                                                                  TYPE: DNA
ORGANISM: Homo sapiens
                                                                                                                                                                                 NAME/KEY: unsure
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APPLICANT: Algate, Paul A.
APPLICANT: Mannion, Jane
TITLE OF INVENTION: COMPOSITIONS AND METHODS FOR THE DETECTION, DIAGNOSIS AND THERAPY
TITLE OF INVENTION: HEMATOLOGICAL MALIONANCIES
FILE REFERENCE: 2077.001200
CURRENT PAPLICATION NUMBER: US/09/796,692
CURRENT FILING DATE: 2001-03-01
1215 GTTTGCATTCCAGTTGCGCAATCCTGTCCAATGGCCATGCCCTGTTGATGCAGGACAC 1274
                                                                                                                                                                                                                                                         1394 TGCTCGAGGAAGGGGTCCTGGATCCCAAGTCAACCATTGTTGCCATCTTTCCGTCTCCCA 1453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1574 ATCTGTATGAACCCACTCATGGGGCAAGGTCTTGAGCATGGCCCCTGGCCTCACCTCTG 1633
                                                                                                                                                                          1335 CGGCTGGACCAAGGATGACGATGTGCCCTCTAGACTGGCGGATG-AAGCAGCACGCGGCTG 1393
                                                                                                                                                                                                                                                                                                                                                 1454 TGTTATATGCTGGCCCCACAGAGGTCCAGTGGCACTGCAGGTCCCGGATGATTGCGGGTG 1513
                                                                                                                                                                                                                                                                                                                                                                                                                                    CCAATITCTACATIGTGGGGAGGGACCCTGCAGGAATGCCCCCATCCTGAAACCAAGAAGG 1573
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                                                                                                                                                                                                 395 TGGCTGGACAAAGGATGACGATGTTCCTTTGATGTGGCGTATGAAGCAGCATGCTGCAG 336
                                                                                                                                                                                                                                                                                    1275 CTGCCGCAGGCTCCTAGAGAGGGGCTACAAGCACCCGGTCCTCCTACTACACCCTCTGGG
                                          515 CTTTGCATTTCAACTACGCACCCCAGTGCACAATGGACATGCCCTGTTAATGCAGGATAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1694 ATGATCCAGCAAGGCACAATGAGTTTGACTTCAT 1727
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PRIOR APPLICATION NUMBER: 60/186,126
PRIOR FILING DATE: 2000-03-01
PRIOR FILING DATE: 2000-03-17
PRIOR FILING DATE: 2000-03-17
PRIOR FILING DATE: 2000-03-17
PRIOR FILING DATE: 2000-04-27
PRIOR APPLICATION NUMBER: 60/200,303
PRIOR APPLICATION NUMBER: 60/200,303
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R FILING DATE: 2000-04-28

R FILING DATE: 2000-04-28

R PPLICATION NUMBER: 60/200,999

R FILING DATE: 2000-05-01

R APPLICATION NUMBER: 60/200,999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 8898, Application US/09796692
Publication No. US20020198362A1
GENERAL INFORMATION:
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PRIOR FILING DATE: 2000-08-03
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: 60/206,201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE: 2000-08-04
APPLICATION NUMBER: 60/223,378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION NUMBER: 60/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILING DATE: 2000-05-04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE: 2000-05-22
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
APPLICANT: Lillie, James
APPLICANT: Xu, Yongyao
APPLICANT: Wongyao
TITLE OF INVENTION: NOVEL GENES, COMPOSITIONS, KITS, AND METHODS
TITLE OF INVENTION: THERAPY OF BREAST CANCER
TITLE OF INVENTION: THERAPY OF BREAST CANCER
FILE REFERENCE: MRI-049
CURRENT FILING DATE: 2002-07-18
PRIOR APPLICATION NUMBER: 60/306,220
PRIOR PILING DATE: 2001-07-18
SPRIOR PILING DATE: 2001-07-18
NUMBER OF SEQ ID NOS: 14084
SOFTWARE: FastEop for Windows Version 4.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                   1475 AGGTCCAGTGCCACTGCAGGTCCCGGATGATTGCGGGTGCCAATTTCTACATTGTGGGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           127 AGGICCAGTGGCACTGCAGGTCCCGGATGATTGCGGGGTGCCAATTTCTACATTGTGGGGA
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                                                                                                                                                                                                             FEATURE:
NAME/KEY: misc_feature
LOCATION: 620, 658, 687, 703, 727, 754, 764, 765, 783, 792
OTHER INFORMATION: n = A,T,C or G
US-10-198-846-5659
                                                                                                                                                                                                                                                                                                                                                                                                       1; Indels
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                                                                                                                                                                                                                                                                                                                                                   Score 233.4; DB 9;
Pred. No. 2.4e-68;
0; Mismatches 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 233.4; DB 9;
Pred. No. 2.5e-68;
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CURRENT FILING DATE: 2002-07-18
PRIOR APPLICATION NUMBER: 60/306,220
PRIOR FILING DATE: 2001-07-18
NUMBER OF SEQ ID NOS: 14084
SOFTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 5659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; Sequence 12859, Application US/10198846
; Publication No. US20030099974A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ) NAME/KEY: misc_feature

) LOCATION: 1, 2, 3, 4, 5, 6, 7, 8,

LOCATION: 18, 19, 824, 825, 826

) OTHER INFORMATION: n = A,T,C or G

US-10-198-846-12859
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99.6%;
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al Similarity 99.6%;
234; Conservative
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                                                                                                                                                                 TYPE: DNA
ORGANISM: Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: DNA
ORGANISM: Homo sapiens
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US-10-198-846-12859
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Best Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1616 CCCCTGGCCTCACCTCTGTGGAAATCATTCCATTCCGAGTGGCTGCCTACAACAAAGCCA 1675
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301 CACGAATGCGCAAACTTGCTCGAGAAGGCCAGAAACCACCTGAAGGTTTCATGGCTCCCA 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0; Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 600;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             13.2%; Score 243; DB 9; Length 60 75.2%; Pred. No. 1.1e-71; Live 0; Mismatches 100; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Wang, Youzhen
APPLICANT: Steinmann, Kathleen
TITLE OF INVENTION: NOYEL GENES, COMPOSITIONS, KITS,
TITLE OF INVENTION: FOR IDENTIFICATION, ASSESSMENT,
FITLE OF INVENTION: THERAPY OF BREAST CANCER
FILE REFERENCE: MRI-049
CURRENT APPLICATION NUMBER: US/10/198,846
                                                          PRIOR FILING DATE: 2000-05-22
PRIOR FILING DATE: 2000-05-22
PRIOR FILING DATE: 2000-05-22
PRIOR PILING DATE: 2000-07-14
PRIOR PILING DATE: 2000-07-14
PRIOR PILING DATE: 2000-08-03
PRIOR PILING DATE: 2000-08-03
PRIOR FILING DATE: 2000-08-04
PRIOR FILING DATE: 2000-08-07
PRIOR FILING DATE: 2000-08-07
PRIOR FILING DATE: 2000-08-07
PRIOR FILING DATE: 2000-08-07
PRIOR FILING DATE: 2001-08-07
PRIOR FILING DATE: 2001-03-01
NUMBER OF SEQ ID NOS: 10467
SOFTWARE: PASLSEQ for Windows Version 3.0
SEQ ID NO 8898
  APPLICATION NUMBER: US 60/202,084
                      FILING DATE: 2000-05-04
APPLICATION NUMBER: US 60/206,201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 5659, Application US/10198846 Publication No. US20030099974A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; LOCATION: (572)
; OTHER INFORMATION: n=A,T,C or G
US-10-040-862-8898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 13.28
Best Local Similarity 75.28
Matches 303; Conservative
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ORGANISM: Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAME/KEY: unsure
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 14
US-10-198-846-5659
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757.2 41.0 860 13 BIB31135 743.6 40.3 949 14 BQ926758 734.8 39.8 1041 13 BIB2944 722.6 39.2 1054 14 BQ942867 704.8 38.2 874 14 BQ942867 672.4 36.4 917 14 BQ943848 673.4 36.4 917 14 BQ943547	624.8 -33.9 650 12 BE786119 624 33.8 797 13 BI105516 613.8 33.3 620 13 BI263737 582.8 31.5 1048 14 BM903600 580.4 31.5 873 14 BQ221395 579.4 31.4 684 12 BG438005 558.8 30.3 767 9 AL648997	546.8 29.6 972 14 BQB96549 528 28.6 640 12 BGB23104 517.8 28.1 959 9 AL574314 513.2 27.8 906 12 BF182876 512 27.8 624 10 BE292722 508 27.5 944 13 BM458655	503 27.3 946 12 BG490797 488.8 26.5 492 14 BM708017 476.8 25.8 490 14 BQ776777 465 25.2 584 12 BG723809 459 24.9 576 10 BE311856	441.4 23.9 870 13 BI101136 440.2 23.9 549 13 BI338434 436.2 23.6 557 10 AW571670 433.8 23.5 741 13 BI85564	36 425.8 23.0 886 12 BF788130 BF788130 BF788130 602113327 88 424.6 23.0 938 12 BF788130 BF788130 602113327 89 424.6 23.0 938 12 BF788130 BF788130 602113327 89 424.6 23.0 712 12 BF788130 BF788130 602113327 40 423.6 23.0 1062 12 BF788130 BF788130 602318241 41 419.2 22.7 979 13 BF257912 BF78813 BF57912 602970843 42 415.6 22.5 804 13 BF852968 BF852968 603379782 44 412.8 22.4 715 13 BF852968 BF852968 603379782 45 407.2 22.1 916 9 AL517203 AL517203 AL517203 AL517203	ALIGNMENTS	RESULT 1 BQ957456 LOCUS DGCUS DGCUS DGCUS DEFINITION AGENCOURT_8786574 NIH_MGC_18 Homo sapiens cDNA clone IMAGE:6371441 5', mRNA Sequence. ACCESSION BQ957456 VERSION REYMORDS GST. SOURCE Numan. ORGANISM Homo sapiens DRACIACOURT 122372934 REYMORDS SOURCE Numan. ORGANISM Homo sapiens BUACIACOURT 10:22372934 REYMORDS MAMMATATYOTA: MACAZOA: Chordata; Craniata; Vertebrata; Euteleostomi; REFERENCE 1 (bases 1 to 956)	AUTHORS NIH-MGC http://mgc.nci.nih.gov/.  TITLE National Institutes of Health, Mammalian Gene Collection (MGC) JOURNAL Unpublished (1999) COMMENT Contact: Robert Strausberg, Ph.D. Email: cgapbs-r@mail.nih.gov Tissue Procurement: DCTD/DTP/Gazdar	CDNA Library Preparation: Rubin Laboratory CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL) DNA Sequencing by: Agencourt Bioscience Corporation Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at: http://image.llnl.gov Plate: LLCM2545 row: j column: 18 High quality sequence stop: 633. FEATURES I956 I956
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen nucleic - nucleic search, using sw model	<pre>Kun on: June 4, 2003, 15:10:31; Search time 2709 Seconds (without alignments)</pre>	Scoring table: IDENTITY_NUC Gapop 10.0 , Gapext 1.0 Searched: 16154066 seqs, 8097743376 residues	Total number of hits satisfying chosen parameters: 32308132 Minimum DB seq length: 0 Maximum DB seq length: 2000000000	ŭ			14: gb_estb:* 15: em_estfun:* 16: em_estfun:* 17: gb_gss:* 18: em_gss_inv:* 19: em_gss_inv:* 20: em_gss_inv:* 21: em_gss_vrt:* 22: em_gss_vrt:* 23: em_gss_mam:* 24: em_gss_mam:* 25: em_gss_pro:* 27: em_gss_rother:* 27: em_gss_rother:*	Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.	Result         Query         Description           No.         Score         Match Length DB ID         Description           1         907         49.2         956 14         BQ957456         BQ957456 AGENCOURT           2         906.6         49.1         1766 11         BC032513         AL540583 AL540583           3         866.2         46.9         951 9         AL540583         AL540583 AL540583           4         884.6         46.3         985 14         BQ924333         AL550460           5         853.6         46.3         915 14         BQ924373         BQ9244373           6         777.6         42.1         872 14         BQ220909         AGENCOURT

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VIH-MGC Project URL: http://mgc.nci.nih.gov

Contact: MGC help desk

Email: cgapbs-refmail.nih.gov

Tissue Procurement: ATCC

CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)

DNA Sequencing by: National Institutes of Health Intramural

Sequencing Center (NISC),

Gailthesburg, Maryland,

Web site: http://www.nisc.nih.gov/

Contact: nisc_mgc@hgri.nih.gov

Akhter,N., Ayele,K., Beckstrom-Sternberg,S.M., Benjamin,B.,

Blakesley,R.W., Bouffard,G., Breen,K., Brinkley,C., Brooks,S.,

Dietrich,N.L., Granite,S., Guan,X., Gupta,J., Haghighi,P.,

Maduro,Q.L., Mastello,C., Maskeri,B., Mastrian,S.D., McCloskey,J.C.,

McDowell,J., Pearson,R., Stantripop,S., Thomas,P.J., Touchman,J.W.,

Young A., Andrey, M., Malker,M.A., Wetherby,K.D., Wiggins,L.,

Vonna A., Andrey, M., Wiggins,L.,

Vonna A., Andrey, M., Wiggins,L.,

Vonna A., Andrey, M., Wetherby,K.D., Wiggins,L.,

Vonna A., Andrey, M., Wetherby, M., Wetherb
                                                                                                              ACTACACCCTCTGG-GCGCCTGGACCAAGGATGACGATGTGCCCTCTAGACTGGCGGATGA 1378
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This clone was selected for full length sequencing because it passed the following selection criteria: matched mRNA gi: 20127474
This clone has the following problem: frame shifted.

Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
1 (bases 1 to 1766)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (06-JUN-2002) National Institutes of Health, Mammalian
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gene Collection (MGC), Cancer Genomics Office, National Cancer
Institute, 31 Center Drive, Room 11A03, Bethesda, MD 20892-2590,
                                                                                                                                                                                                                 1379 AGCAGCACGCG-GCTGTGCTCGAGGAGGGGTCCTGGATCCCAAGTCAACCATTGT 1433
                                                                                                                                         1260 GTTGATGCAGGACACCTGCCGCAGGCTCCTAGAGAGGGGGCTACAAGCACCCGGTCCTCCT
                                                                                                                                                                                                                                                                                                                                                                                                 BC032513 1766 bp mRNA linear HTC 27-JUN.
Homo sapiens, Similar to 3'-phosphoadenosine 5'-phosphosulfate
Synthase 1, clone IMAGE:5492659, mRNA.
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                                                                                                                                                                                                                                                    Length 1766;
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.4e-255;
es 479; I
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/clone_lib="NIH_MGC_67"
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Pred. No. 8.4e-:
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Young, A., Zhang, L.-H. and Green, E.D.
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366 c 476 g 438 t
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/db_xref="taxon:9606"
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Best Local Similarity 71.4%;
Matches 1193; Conservative
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BC032513.1
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BC032513
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COMMENT
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                                         /clone="IndexColl 3000"
/clone="IndexColl 3000"
/clone="IndexColl 3000"
/tissue="Ype="large cell carcinome"
/tissue=Ype="large cell carcinome"
/tissue=Ype="large cell carcinome"
/lab_host="large cell carcinome"
/lab_host="large cell carcinome"
/note="Organ: lung. Vector: pOTPT; Site_1: XhoI; Site_2:
ECORI; cDNA made by oligo-dT priming. Directionally cloned
into EcoRI/AnoI sites using the following 5' adaptor:
GGCACGAG(G). Library constructed by Ling Hong in the
laboratory of Gerald M. Rubin (University of California,
Berkeley) using ZAP-cDNA synthesis kit (Stratagene) and
Superscript II RT (Life Technologies). Note: this is a
NIH.MGC Library."

2 a 220 c 258 g 214 t 2 others
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1020 ACGCTGTTCCCGTGTTTGGGGGACAACATGTACAAAACACCCCCATATCAAAATGGTGAT 1079
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Pred. No. 2.4e-255;
0; Mismatches 16;
/organism="Homo sapiens"
/db_xref="taxon:9606"
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98.18;
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Best Local Similarity 98.1'
Matches 938; Conservative
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Qy	Q <u>y</u> Db	Qy	QY	Qy Dp	Qy Db	OY DP	Qy	Qy Dp	OY Db	RESUI ALS40 LOCUS	DEFIN ACCES VERSI	KEYWC SOURC ORG	REFER AUT TIT	COMME	FEATU		
9 GATCAAGAAGAAGGAGAACCAGCAGAAATCCACCAATGTAGTCTATCAGGCCCA 68	69 CCATGTGAGCAGGAATAAGAGAGGGCAAGTGGTTGGAACAAGGGGTGGGT	< <	189 GGAGTACCTTGTCTCCCATGCCATCCCTGGATGGGGACAATGTCCGTCA 248	249 TGGCCTTAACAGAAATCTCGGATTCTCTCTGGGGACAGAGAGAAAATATCCGCCGGAT 308 	309 TGCTGAGGTGGCTAAGCTGTTTGCTGATGCTGGTCTGCATTACCAGCTTTATTTC 368 	369 TCCATTCGCAAAGGATCGTGAGAATGCCCGCAAAATACATGAATCAGCAGGGCTGCCATT 428 	429 CTITGAAATATITGTAGATGCACCTCTAAATATITGTGAAAGCAGAGACGTAAAAGGCCT 488 	489 CTATAAAAGGCCAGAGCTGGGGAGATTAAAGGATTTACAGGTATTGATTCTGATTATGA 548 	549 GAAACCTGAAACTCCTGAGCGTGTGCTTAAAACCAATTTGTCCACAGTGAGTG	609 CCACCAGGTAGTGGAACTICTGCAAGAGCAGAACATTGTACCTATACTATA	669 TATCCACGAACTCTTTGTGCCGGAAAACAAACTTGACCACGTCCGAGCTGAGGCTGAAAC 728 	729 TCTCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGGTTTTGAGGGAAGG 788	789 CTGGGCCACTCCCCTCAAAGGTTTCATGCGGAGAAGAGTACTTACAGGTTATGCACTT 848 	849 TGACACCCTGCTAGATGATGGACATCAACATCCCCATTGTACTGCCCGTCTC 908	909 TGCAGAGGATAAGACGCCTGGAAGGGTGCAGCAAGTTTGTCCTGGCACATGGTGGACG 968	969 GAGGGTAGCTATCTTACGAGACGCTGAATTCTATGAACACAGAAAGAGGAACGCTGTTC 1028 	1029 CCGIGTTTGGGGGACAACATGTACAAAACACCCCCATATCAAAATGGTGATGGAAAGTGG 1088 
Oy Db	Oy Db	Oy Db	QY	Qy	Qy Db	Qy	QY Db	Qy Db	Oy Db	Qy	Oy Db	· Qy	Qy	Qy	Qy	Qy Db	Qy

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1328
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                                                                                                  1532 TCCCATGATGTATGCTGGACCAACTGAGGTCCAGTGGATGCAGAGAGCACGGATGCTTGC 1591
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I (bases 1 to 951)
Li,W.B., Gruber,C., Jessee,J. and Polayes,D.
Eull-length cDNA libraries and normalization
Unpublished (2001)
Contact: Genoscope Genoscope Genoscope; Centre National de Sequencage
BP 191 91006 EVRY cedex - France
BP 191 91006 EVRY cedex - France
Email: sequelégenoscope.cns.fr, Web: www.genoscope.cns.fr.
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                                                                                                                                                                                    1449 TCCCATGTTATATGCTGGCCCCACAGAGGTCCAGTGGCACTGCAGGTCCCGGATGATTGC
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1089 GGACTGGCTGGTTGGTGGAGACCTTCAGGTGCTGGAGAAATAAGATGGAATGATGGGCT
                                                                             1209 TGCGGTGTTTGCATTCCAGTTGCGCAATCCTGTCCACAATGGCCATGCCCTGTTGATGCA
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/db_xref="taxon:9606"
/clone="cs0bE002xM23"
/clone_lib="LTL FL002_PL1"
/lab_host="DH108"
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1. .951
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DEFINITION
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COMMENT
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KEYWORDS
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   RESULT 4
AL550460
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Technologies. Contact : Feng Liang Life Technologies, a distain of Invitrogen 9800 Medical Center Drive Rockville (Maryland 20806) USA Fax : (1) 301 610 8371 Email : filang@lifetech.com URL
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                           http://fulllength.invitrogen.com"
231 c 245 g 227 t
                                                          Score 866.2; DB 9;
Pred. No. 2.5e-243;
; Mismatches 0;
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Similarity 99.8%;
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/organism="Homo sapiens"
/db_xref="taxon:9606"
/clone="csollo57y020"
/clone="csollo57y02"
/clone="type="placenta"
/tissue_type="placenta"
/rissue_type="placenta"
/rote="weetor: pCWNSPORT 6; Site_1: NotI; lst strand cDNA
was primed with a NotI-oligo(dT) primer. Five prime end
enriched, double-stranded cDNA was digested with Not I and
cloned into the Not I and Eco RV sites of the pCMVSPORT 6
vector. Library was normalized. Library was constructed by
Life Technologies. Contact: Feng Liang Life Technologies,
a division of Invitrogen 9800 Medical Center Drive
Rockville, maryland 20850, USA Fax: (1) 301 610 8371
Email: fliang@lifetech.com URL:
http://fullength.invitrogen.com"

a 200 c 227 g 214 t
    bp mRNA linear EST 16-FEB-2001 sapiens cDNA clone CSODIO57YOO2 5
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BP 191 91006 EVRX cedex - France
Email: segrefégenoscope.cns.fr, Web.: www.genoscope.cns.fr.
Location/Qualifiers
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Li,W.B., Gruber,C., Jessee,J. and Polayes,D. Unpublished (2001)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity 99.9%; Pred. No. 6.2e-240;
4; Conservative 1; Mismatches 0;
  886
HOMO
                     LTI_NFL006_PL2
                                                                                  AL550460.1 GI:12887457
                                         prime, mRNA sequence.
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Superscript II RT (Life Technologies). Note: this is a NIH_MGC Library."  BASE COUNT 252 a 210 c 245 g 207 t 1 others ORIGIN	tch 46.3%; Score 853.6; DB 14; Length 915; al Similarity 98.1%; Pred. No. 1.2e-239; cons. concentration of the second of the sec	467	Db 1 AAAGCAGAGACGTAAAAGGCCTCTATAAAAGGCCAGAGCTGGGGAGATTAAAGGATTTA 60 Qy 527 CAGGTATTGATTCTGATTATGAGAAACTCCTGAAACTGTGAGCGTGTGCTTAAAACCAATT 586		QY 587 TGTCCACAGTGAGTGGTCCACCAGGTAGTGGAACTTCTGCAAGAGCAGAACATTG 646		Db 241 ACGTCCAACTCTCCCTTCATATCAATACTAACTGCAGATCTCCAGT 300	Qy • 767 GGGTCCAGGTTTTGAGCGAAGGCTGGGCCACTCCCCTCAAAGGTTTCATGCGGGAGAAGG 826	Qy 827 AGTACTTACAGGTTATGCACTTTGACACCTGCTAGATGATGGCGTGATCAACATGAGCA 886	QY 887 TCCCCATTGTACTGCCCGTCTCTGCAGAGATAAGACACGGCTGGAAGGTGCAGCATG 946	Qy 947 TIGTCCTGGCACATGGTGGGGGGGTAGCTATCGGAGACGCTGAATTCTATGAAC 1006	QY         1007 ACAGAAAAGAGGAACACTGTTTCCCGTGTTTGGGGACAACATGTACAAAACACCCCCCATA         1066           II:	Qy 1067 TCAAAATGGTGATGGAAAGTGGGGACTGGTTGGTGGAGACCTTCAGGTGCAGAGA 1126	QY 1127 AAATAAGATGGAATGAT-GGGCTGGACCAATACCGTCTGACACCTCTGGAGCTCAAACAG 1185	Qy 1186 AAATGTAAAGAATGGATGCTGATGCGTTTGCATTCCAGTTGCGCAATCCTGTCCAC 1245	Qy 1246 AATGGCCATGCCCTGTTGATGCAGGACCCTGCGCAGGCTCCTAGAGAGGGGCTACAAG 1305	Qy 1306 CACCGGT-CCTCCTACTACACCCTCTGGGCGGCTGG-ACCAAGGATGACGATGTGCCTC 1363	Qy 1364 TAGACTGGGGA 1375 
Db 445 CTGCCATTCTTGAAATATTGTAGATGCACCTCTAAATATTTGTGAAAGCAGAGACGTA 504 Oy 481 AAAGGCCTCTATAAAAGGGCCAGAGCTGGGGAGATTAAAAGGATTAAAGGATTTACAGGTTTAAAGGATTTAAAGGATTTAAAGGATTTAAAGGATTTACAGGTTTAAAGGATTTACAGGTTTAAAGGATTTACAGGTTTAAA		51 SATTATGAGAAACCTGAAACCTGAGCGTGTGCTTAAAACCAATTGTCACAGGAGTGTGCTGTGCTTTAAAACCAATTGTCACAGGAGTGTGAGAGGAGAGGAGAGGAGAGGAGAGGAGAGGAG	QY 601 GACTGTGCCACCAGGTAGTGGAACTTCTGCAAGAGCAGAACATTGTACCCTATACTATA 660	661 ATCAAAGATATCCACGAACTCTTTGTGCCGGAAACAAACTTGACCACGTCCGAGCTGAG	Db 685 ATCAAAGATATCCACGAACTCTTTGTGCCGGAAACAAACA	805	Oy 841 ATGCACTTTGACACC 855	Db 865 ATGCACTTTGACACC 879	ESOLT 5 B0924373 LOCUS B0924373 LOCUS B0924373 DEFINITION AGENCOURT B794733 NIH_MGC_18 Homo sapiens cDNA clone IMAGE:6374672	ACCESSION B0924373.1 GI:22339404 VERSION B0924373.1 GI:22339404 SOURCE BOT.	ORGANISM Homo sapiens ORGANISM Homo sapiens Bukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo:	RS AL	COMMENT Contact: Robert Strausberg, Ph.D.  Email: cgapbs-remail.nih.gov Tissue Procurement: DCTD/DPP/Gazdar CDNA Library Preparation: Rubin Laboratory	Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortlum/LLNL at:	nttp://m Plate: LI High qual	SOULCE 1.913 /organism="Homo sapiens" /db_xref="taxon:9606" /clone="Inagg:6374672"	/tissue_type="large call carcinoma" /tissue_type="large call carcinoma" /lab_host="DH10" (phage-resistant)" /note="Organ: lung; Vector: pOTB7; Site_1: XhoI; Site_2:	ECORI; CDNA made by Oligo-dT priming. Directionally cloned into EcoRI/XhoI sites using the following 5' adaptor: GGCACGAG(G). Library constructed by Ling Hong in the laboratory of Gerald M. Rubin (University of California, Berkeley) using 2AP-cDNA synthesis kit (Stratagene) and

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/crganism="Homo sapiens"
/db_xref="taxon:9666"
/db_xref="taxon:9666"
/clone="IMAGE:5172430"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Dukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Eutheria; Butheria; Primates; Catarrhini; Hominidae; Homo.
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
El (bases 1 to 860)
I (contact: Robert Strausberg, Ph.D.
Email: cgapbs-rémail.nih.gov
Tissue Procurement: Life Technologies, Inc.
Contact: Robert Strawed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Incyte Genomics, Inc.
Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at:
Clone distribution: MGC column: 23
High quality sequence stop: 851.
Location/Qualifiers
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                                                                                                                                                 1002 TGAACACAGAAAAGAGGAACGCTGTTCCCGTGTTTGGGGGACAACATGTACAAAACACCC
                                          GACCACGTCCGAGCTGAGGCTGAAACTCTCCCTTCATTATCAATTACTAAGCTGGATCTC
                                                                                                                             CAGTGGGTCCAGGTTTTGAGCGAAGGCTGGGCCACTCCCCTCAAAGGTTTCATGCGGGAG
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                               872 bp mRNA linear EST 02-MAY-2002
AGENCOURT_7504327 NIH_MGC_72 Homo sapiens cDNA clone IMAGE:6049802
5′, mRNA sequence.
BQ220909
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/lab_host="DH10B (phage-resistant)"
/note="organ: skin; Vector: pCMV-SPORT6; Site_1: Not1;
Site_2: Sal1; Cloned unidirectionally. Primer: Oligo dT.
Average insert size 2 kb. Library constructed by Life
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                343 CTGGTCTGCATTACCAGCTTTATTTCTCCATTCGCAAAGGATCGTGAGAATGCCCGCAAA 402
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                                                                                                                                                                                                                                   Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                            Email: cgapbs-remail.nih.gov
Tissue Procurement: ATCC/DCTD/DTP
CDNA Library Preparation: Life Technologies, Inc.
CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Agencourt Bioscience Corporation
Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at:
http://image.llnl.gov. a column: 03
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1 (bases 1 to 872)

NIH-MGC http://mgc.nci.nih.gov/
National institutes of Health, Mammalian Gene Collection (MGC)
Unpublished (1999)
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Pred. No. 2.8e-217;
0; Mismatches 21;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1. .872
/organism="Homo sapiens"
/db_xref="taxon:9606"
                                                                                                                                                                                                                                                                                                                                                                Contact: Robert Strausberg, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /clone="IMAGE:6049802"
/clone_lib="NIH_MGC_72"
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Location/Qualifiers
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179 c
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                                                                                                                                                                                                               Homo sapiens
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

E 1 (bases 1 to 94)

S NIH-MGC http://mgc.nci.nih.gov/.

National Institutes of Health, Mammalian Gene Collection (MGC)

L Unpublished (1999)

Contact: Robert Strausberg, Ph.D.

Email: cgapbs-rémail nih.gov/

Tissue Procurement: DCTD/DTP/Gazdar

CDNA Library Preparation: Rubin Laboratory

CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)

DNA Sequencing by: Agencourt Bioscience Corporation

Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at:

http://image.llnl.gov

Plate: LLCM2618 row: n column: 16

High quality sequence stop: 587.

Location/Qualifiers

Irce

Location/Qualifiers

Irce
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//clone_line_ring
//tissue_type="large_cell carcinoma"
//tissue_type="large_cell carcinoma"
//tissue_type="large cell carcinoma"
//note="Organ: lung; Vector: poTB7; Site_1: XhoI; Site_2:
EcoRI; cDNA made by oligo-dT priming. Directionally cloned
into EcoRI/XhoI sites using the following 5' adaptor:
GGCACGAGG, Library constructed by Ling Hong in the
laboratory of Gerald M. Rubin (University of California,
Berkeley) using ZAP-cDNA synthesis kit (Stratagene) and
Superscript II RT (Life Technologies). Note: this is a
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  AGENCOURT_8795627 NIH_MGC_18 Homo sapiens cDNA clone IMAGE:6429903
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D; Mismatches 10;
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/clone="IMAGE:6429903"
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Pred. No. 2.8e-211;
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586 120 646 180 206 240 991

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(Invitrogen). Research Genetics tracking code 013. Note: this is a NIH_MGC Library."  BASE COUNT 269 a 242 c 284 g 246 t ORIGIN	Query Match 39.8%; Score 734.8; DB 13; Length 1041; Best Local Similarity 93.1%; Pred. No. 1.2e-204; Matches 858; Conservative 0; Mismatches 52; Indels 12; Gaps 8;	OY 1 ATGTCGGGGATCAAGAAGCAAAAGACGGAGAACCAGCAGAAATCCACCAAGTGTAGTGTAT 60	Oy 61 CAGGCCCACCATGTGAGCAGAATAAGAGGGCAAGTGGTTGGAACAAGGGGTGGTTC 120		181 GCCCTGGAGGAGTACCTTGTCTCCCATGCCATCCCTTGTTACTCCCTGGATGGGGACAAT	Qy 24.1 GTCCGTCATGGCCTTAACAGAAATCTCGGATTCTCTGGGGGCACAGAGGAAAATATC 300 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Oy 301 CGCCGGATTGCTGAGGTGGCTAAGCTGTTGCTGATGCTGGTCTGGTCTGCATTACCAGC.360	OY 361 TITATTCTCCATTGGCAAGGATGGTGAGAATGCCGCAAAATACATGAATCAGCAGG 420	Qy 421 CTGCCATTCTTTGAAA-TATTTGTAGATGCACCTCTAAATATTGTGAAAGCAGAGGT 479 	Qy 480 aaaaggcctctataaaaggcccagacttggggagattaaaggatttacaggtattgattc 539	OY 540 TGATTATGAGAAACCTGAACTCCTGAGCGTGTGCTTAAAACCAATTTGTCCACAGTGAG 599 11111111111111111111111111111111111	QY 600 TGACTGTGCCACCAGGTAGTGGAACTTC-TGCAAGAGCAGAACATTGTACCCTATACTA 658	Qy 659 TAATC-AAAGATATCCACGAACTCTTTGTGCCGGAAAACTGACCACGTCCGAGCT 717	OY 718 GAGGCTGAAACTCTCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGG 775	OY 776 TITTGAGGGAAGGCTGGGCCACTC-CCCTCAAAGGTTTCATGCGGGAGAAGGTA 830   11	OY 831 CITACAGGTTATGCACTTTGACACCCTGCT-AGATGATGGCGTGA-TCAACATGAGCATC 888	Oy 889 CCCATTGTACTGCCGTCTCG 910
361 AGTACTTACAGGTTATGCACTTTGACACCCTGCTAGATGATGGCGTGATCAACATGAGCA 887 TCCCCATTGTACTGCCGTCTCTGCAGAGGATAAGACACGGCTGGAAGGTGCAGCAAGT	Db 421 TCCCCATTGTACTGCCCGTCTCTGCAGAGGATAAGACACGGTGGAAGGGTGCAGCAAGT 480  Qy 947 TTGTCCTGGCACATGGTGGACGGAGGGTAGCTATCTTACGAGGCTGAATTCTATGAAC 1006  Db 481 TTGTCTTGCAACAATGAACAAACAAACAAAAAAAAAAAA	1007 ACAGAAAGGAACGCTGTTCCCGTGTTGGGGGACAACATGTACAAAAACACCCCCATA 541 ACAGAAAAGGAGGAACGCTGTTCCCGTGTTTGGGGGACAACATGTACAAAAACAACCCCCCATA 541 ACAGAAAAAGGAACGCTGTTGTTCGGGGAAAAGGAAAAAAAA	1067 TCAAAATGGTGATGGAAAGTGGGGACTGGTTGGTGGAACCTTCAGGTGCTGGAGAGAGGGGACTGGCTGG	1127 AAATAAGATGGAAGCTGGACCAATACCGTCTGACCTCTGGAGCTCAACAGA 11111111111111111111111111111111	ANTGTAAAGAAAT-GAATGCTGATGCGGTG-TTTGCATTCCAGTTGCGCAATCC-TGTCC-1	Qy         1244 ACAATGGCCATGCC 1258           Db         781 CCAATGCCCATGCC 795	RESULT 9	z	ACCESSION B1829344  REYNORD B1829344.1 GI:15940894  KEYWORDS EST. SOURCE human.	REFERENCE 1 (bases 1 to 1041)	AUTHORS NHI-MGC Intp://mgc.nci.nin.gov/. TITLE National Institutes of Health, Mammalian Gene Collection (MGC) JOURNAL Unpublished (1999) COMMENT Contact: Robert Strausberg, Ph.D.	Tissue Procurement: Life Technologies, Inc. CDNA Library Preparation: Life Technologies, Inc. CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)	Dun Sequencing by: INCYC SEMBLES, INC. Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at: http://image.llnl.gov	Plate: LLAM11425 row: j column: 19 High quality sequence stop: 841. FEATURES Location/Qualifiers 1. 1041	/db xref="taxon:9666" /clone="IMAGE:5171058" /clone_lib="NH_MGC_119"	/lab_host="DH10B"   wedtor: pCMV-SPORT6; Site_1: NotI; /note="Organ: brain; Vector: pCMV-SPORT6; Site_1: NotI; /site_2: EcorV (destroyed); RNA source normal medulla from site_2: property of the contract of	amonymous mare age 2/. Library is original and directionally cloned (EcoRV site is destroyed upon cloning). Average insert size 1.3 kb, insert size range 0.9-3 kb. Library is normalized and enriched for full-length clones and was constructed by C. Gruber

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EST 21-AUG-2002
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AGENCOURT_8785245 NIH_MGC_18 Homo sapiens cDNA clone IMAGE:6370861
5/, mRNA sequence.
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National Institutes of Health, Mammalian Gene Collection (MGC)
Unpublished (1999)

Contact: Robert Strausberg, Ph.D.
Email: cgapbs-remail.nih.gov
Tissue Procurement: DCTD/DTP/Gazdar
CDNA Library Preparation: Rubin Laboratory
CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Agencourt Bioscience Corporation
Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at:
http://mage.linl.gov
Plate: LLOM2544 row: b column: 14
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Catarrhini; Hominidae; Homo.
                                                                            599 GTGACTGTGTCCACCAGGTAGTGGAACTTCTGCAAGAGCAGAACATTGTACCTATACTA
                                                                                                                                                                                                                                                                                      AGGCTGAAACTCTCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGGTTT
                                                                                                                                                                                                                                                                                                                            559 AGGCTGAAACTCTCCCTTCATTATCAATTACTAAGCTGGATCTCCAGTGGGTCCAGGTTT
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High quality sequence stop: 688.
Location/Qualifiers
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/db_xref="taxon:9606"
/clone="IMAGE:6370861"
/clone_lib="NIH_MGC_18"
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Mammalia; Eutheria;
1 (bases 1 to 874)
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                    AGENCOURT_8836984 NIH_MGC_101 homo sapiens cDNA clone IMAGE:6429378 5', mRNA sequence.
BQ942867 GI:22358345 ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /Tissue_type="epidermoid carcinoma, cell line"
/lab_host="PHIOB (phage-resistant)"
/note="Organ: lung, Vector: pOTB7; Site_1: EcoRI; Site_2:
XhoI; cDNA made by oligo-dT priming. Directionally cloned
into EcoRI/XhoI sites using the following 5' adaptor:
GCACGAGGG(5). Library constructed by Ling Hong in the
laboratory of Gerald M. Rubin (University of California,
Berkeley) using ZAP-cDNA synthesis kit (Stratagene) and
Superscript II RT (Life Technologies). Note: this is a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  199 GCTTTATTCTCCATTCGCAAAGGATCGTGAGAATGCCCGCAAAATACATGAATCAGCAG 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180 TGCCCTGGAGGAGTACCTŢ-GTCTCCCATGCCATCCCTTGTTACTCCCTGGATGGGGACA 238
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        479 TAAAAGGCCTCTATAAAAGGGCCAGAGCTGGGGGAGATTAAAAGGATTTACAGGTATTGATT 538
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DNA Sequencing by: Agencourt Bioscience Corporation
Clone distribution: MGC clone distribution information can be
found through the I.M.A.G.E. Consortium/LLNL at:
http://image.llnl.gov
Plate: LLCM2617 row: h column: 19
High quality sequence start: 24
High quality sequence stop: 736.
Location/Qualifiers
I. 1054
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National Institutes of Health, Mammalian Gene Collection (MGC)
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Contact: Robert Strausberg, Ph.D.
Email: cgapbs.r@mail.nih.gov
Tissue Procurement: Arc
CDNA Library Preparation: Rubin Laboratory
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/clone_lib="NIH_MGC_101"
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Mammalia; Eutheria; P
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/tissue_type="large cell carcinoma"
/lab_host="DH10B (phage-resistant)"
/note="Corgan: lung: Vector: poTB7; Site_1: XhoI; Site_2:
ECORI; cDNA made by oligo-dr priming. Directionally cloned
into ECORI/XhoI sites using the following 5' adaptor:
GCACGAG(GG(G). Library constructed by Ling Hong in the
laboratory of Gerald M. Rubin (University of California,
Berkeley) using ZAP-cDNA synthesis kit (Stratagene) and
SUPERSCRIPT I RT (Life Technologies). Note: this is a
127 c 244 g 193 t
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                                                                                                                                                                                       ACTITIGACACCCTGCTAGA--------TGATGGCGTGATCAACATGAGCATCC
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                                                                                                                                   Score 704.8; DB 14; Length 874;
Pred. No. 7.5e-196;
0; Mismatches 12; Indels 19;
                                                                                                                                     38.2%;
96.1%;
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Matches 761;
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/organism="Homo sapiens"
/ob_xref="taxon:9606"
/clone="InAGE:6372309"
/clone=lib="NHH_MGC_18"
/tissue_type="large_cell_carcinoma"
/tasue_type="large_cell_carcinoma"
/tasue_type="large_cell_ca
    bp mRNA linear EST 21-AUG-200
Homo sapiens cDNA clone IMAGE:6372309
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                           1 (bases 1 to 917)
NIH-WGC http://mgc.nci.nih.gov/.
National Institutes of Health, Mammalian Gene Collection (MGC)
Unpublished (1999)
Contact: Robert Strausberg, Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 ATGTCGGGGATCAAGAAGCAAAAGACGGAGAACCAGCAGAAATCCACCAATGTAGTCTAT
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Tissue Procurement: DCTD/DTP/Gazdar
Tissue Procurement: DCTD/DTP/Gazdar
CDNA Library Preparation: Nubin Laboratory
CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Agencourt Bioscience Corporation
Clone distribution: MGC clone distribution information con if
Cound through the I.M.A.G.E. Consortium/LLNL at:
http://image.lln.gov n column: 22
High quality sequence stop: 585.
Location/Qualifiers
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11 Similarity 96.7%; Pred. No. 2.6e-186;
707; Conservative 0; Mismatches 19;
917
AGENCOURT_8772851 NIH_MGC_18
5', mRNA sequence
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                                                                                           5′, mRNA sequence.
BO935947
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and was constructed by Clontech Laboratories (Palo Alto, CA). Note: this is a NIH_MGC Library."
                                                                            Score 629; DB 12;
Pred. No. 1.4e-173;
); Mismatches 5;
                                                                                                            0; Mismatches
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BE786139.1 GI:10207337
                                                                            Query Match 34.1%;
Best Local Similarity 98.5%;
Matches 677; Conservative
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5fil (ggccgctcggcc); Site_2: Sfil (ggccattatggcc); 5' and
3' adaptors were used in cloning as follows: 5' adaptor
sequence: 5'-GAGGCCATARGGCC3' and 3' adaptor sequence:
5'-ATTCTARAGGCGAGGGGCGATG-dT(30)BN-3' (where B = A,
c, c, or and N = A, c, G, or T). Average insert size 1.9
kb (range 0.5-4, 0 kb). 12/15 colonies contained inserts
by PCR. This library was enriched for full-length clones
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BG484421 683 bp mRNA linear EST 21-MAR-2001 602505063F1 NIH_MGC_77 Homo sapiens cDNA clone IMAGE:4618575 5',
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
1 (bases 1 to 683)
NIH-MGC http://mgc.nci.nih.gov/.
National Institutes of Health, Mammalian Gene Collection (MGC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Unpublished (1999)
Contact: Robert Strausberg, Ph.D.
Email: cgapbs-refmail.inh.gov
Tissue Procurement: CLONTECH Laboratories, Inc.
CDNA Library Preparation: CLONTECH Laboratories, Inc.
CDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Incyte Genomics, Inc.
Clone distribution: MGC clone distribution information can be found through the I.M.A.G.E. Consortium/LLNL at:
http://mage.llnl.gov
Plate: LLCM1376 row: n column: 16
High quality sequence stop: 674.
                                                                                                            CTGCCATTCTTTGAAATATTTGTAGATGCACCTCTAAAATATTTGTGAAAGCAGAGGACGTA
                                                                                                                                                          AAAGGCCTCTATAAAAGGGCCAGAGCTGGGGAGATTAAAAGGATTTACAGGTATTGATTCT
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                               TTTATTTCTCCATTCGCAAAGGATCGTGAGAATGCCCGCAAAATACATGAATCAGCAGGG
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/lab_host="DH10B (T1 phage-resistant)"
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/db_xref="taxon:9606"
/clone="IMAGE:4618575"
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BG484421
BG484421.1 GI:13416700
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AUTHORS
TITLE
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NIH-MGC http://mgc.nci.nih.gov/.
National Institutes of Health, Mammalian Gene Collection (MGC)
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Mammalia; Eutheria; Primates; Catarrhini; Hominidae;
1 (bases 1 to 650)
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Pred. No. 2.3e-172;
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        Contact: Robert Strausberg, Ph.D.
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mus musculus.

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Rodentia; Sclurognathi; Muridae; Mus.

E 1 (bases 1 to 797)

National institutes of Health, Mammalian Gene Collection (MGC)

National institutes of Health, Mammalian Gene Collection (MGC)

AL Unpublished (1999)

Contact: Robert Strausberg, Ph.D.

Contact: Robert Strausberg, Ph.D.D.

Contact: Robert Strausberg, Ph.D.D.

Contact: Robert Strausberg, Ph.D.D.

Contact: Robert Strausberg, Ph.D.D.

Contact: Rober
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musculus cDNA clone IMAGE:5044119
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/clone=lib="NCI_CGAP_Kid14"
/lab_host="DH10B (TI phager resistant)"
/note="Organ: Kidney; Vector: pcMV-SPORT6; Site_1: NotI;
Site_2: Sall; Cloned unddirectionally. Primer: Oligo dT.
Average insert size 1.75 kb. Constructed by Life
Technologies Note: this is a NCI_CGAP Library. |"
195 c 222 g 177 t l others
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Pred. No. 4.3e-172;
0; Mismatches 101; Indels
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/db_xref="taxon:10090"
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al Similarity 87.2%;
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BI103516
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1295 GGGGCTACAAGCACCCGGTCCTCCTACTACACCCTCTGGGCGGCTGGACCAAGGATGACG 1354
                                                    1355 ATGTGCCTCTAGACTGGCGGATGAAGCAGCACGCGGCTGTGCTCGAGGAAGGGGTCCTGG 1414
                                                                                                           1415 ATCCCAAGTCAACCATTGTTGCCATCTTTCCGTCTCCCATGTTATATGCTGGCCCCACAG 1474
                                                                                                                                                                  1475 AGGTCCAGTGGCACTGCAGGTCCCGGATGATTGCGGGTGCCAATTTCTACATTGTGGGGA 1534
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                                                                                                                         481 ATCCCAAGTCAACTATTGTTGCCATCTTTCCATCTATGTTATATGCTGGTCCCACAG 540
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              721 TGGCTGCCTACAATAAAATTAAAACAAGCGCATGGACTTTTATGATCCAGCAAGGCACGAG 780
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Search completed: June 4, 2003, 17:28:35 Job time: 2720 secs

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